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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

ACRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences—1935.

Murray Lands (East), at Alawoona, Tuesday, October 1st (A. J. Pengilly, Secretary).

Fruit (Non-irrigated), at Lyndoch, Tuesday, November 5th (J. S. Hammat, Secretary, Williamstown).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

North-Western, Crystal Brook, Wednesday, September 4th.
Snowtown, Wednesday, September 11th.
Laura, Wednesday, September 25th.
Eudunda, Wednesday, September 25th.
Gawler, Saturday, September 28th.
Balaklava, Saturday, September 28th.
Waikerie, Saturday, September 28th.
Karoonda, Wednesday, October 2nd.
Streaky Bay, Wednesday, October 2nd.
Murray Bridge, Friday and Saturday, October 4th and 5th.
Cleve, Saturday, October 5th.
Kapunda, Saturday, October 5th.
Peterborough, Saturday, October 5th.
Kadina, Saturday, October 5th.
Jamestown, Wednesday, October 9th.
Loxton, Wednesday, October 9th.
Strathalbyn, Wednesday, October 9th.
Penola, Wednesday, October 9th.
Blyth, Saturday, October 12th.
Moonta, Saturday, October 12th.
Pinnaroo, Wednesday, October 16th.
Saddleworth, Wednesday, October 16th.
Mount Remarkable, Wednesday, October 16th.
Maitland, Wednesday, October 16th.
Kingston, Saturday, October 19th.
Clare, Saturday, October 19th.
Minlaton, Wednesday, October 23rd.
Mount Gambier, Wednesday and Thursday, October 23rd and 24th.
Burra, Wednesday, October 23rd.
Lucindale, Saturday, October 26th.
Southern, Port Elliot, Saturday, October 26th.
Tatiara (Bordertown), Wednesday and Thursday, October 30th and 31st.
Millicent, Saturday, November 2nd.
Kingscote, Thursday, November 7th.
Oakbank, Saturday, November 9th.
Kalangadoo, Saturday, November 16th.
Angaston, Saturday, February 29th, 1936.
Mundalla, Wednesday, March 4th, 1936.
Mount Pleasant, Thursday, March 19th, 1936.

THE EVENT OF THE YEAR.

Royal Spring Show

September 14 to 21 (inclusive),

7 Days and 7 Nights.

Record Live Stock Entries. Record Trade Displays.

The State's Shop Window.

SEE THE—

Live Stock, Log Chopping,

Military and Police Carnival,

Trotting, Horses-in-Action,

Sheep Dog Trials under Electric Light and a host of other Attractions.

BECOME A MEMBER OF THE SOCIETY.

See everything there is to be seen.

The Subscription is £1 1s. (no nomination fee), entitling the member to one member's ticket and two ladies' tickets for every session the Show is open. Ladies' tickets are transferable and will admit boys under 14 years of age.

There is a Special Grand Stand reserved for members.

Eagle Chambers,
Pirie Street, Adelaide.

HAROLD J. FINNIS,
Secretary.

Crushed Thistle Seed—Value for Live Stock.

The Secretary of the Black Springs Branch of the Agricultural Bureau forwarded a sample of thistle seed to the Department of Agriculture, requesting that it might be analysed to ascertain its livestock feeding value. Mr. R. C. Scott (Supervisor of Experimental Work), to whom the inquiry was submitted, says the sample of crushed thistle seed has been analysed by the Department of Chemistry, with the following results:—

	Per cent.
Moisture	9.7
Fat	10.8
Fibre	41.8
Ash	2.2
Protein (N x 6.25)	13.0
Carbohydrates	22.5
	100.00 per cent.

In order to make a comparison of the feeding value with other recognised foodstuffs it is necessary to ascertain the relative digestibility of the constituents. No information regarding this point is available, and it has been assumed that the digestible co-efficient of the thistle seed is midway between that of cotton seed and linseed. On this basis, the sample has a starch equivalent of 72.83 comparatively with 73.2 for wheat, 59.7 for oats, 60.0 for barley, and 68.6 for pease. It is therefore approximately equal to wheat and oats in feeding value for ruminant livestock, provided that the material possesses at least equal palatability.

Feeding Sows Before Farrowing.

The Blackheath Agricultural Bureau asks "What is the best method of feeding a sow just before and after farrowing?" Mr. H. B. Barlow (Chief Dairy Instructor), in reply, says probably the best treatment for a sow before farrowing is grazing in a good grass paddock; if necessary, supplemented with sufficient grain ration (wheat, barley, or oats) to keep the sow in good condition. Near farrowing time it is very helpful if the sow can be given 1gall. to 2galls. of skim milk per day and the grain ration can be slightly increased. A mixture of crushed oats and barley will help milk production. A sow should not be too fat at farrowing time, but should be in good medium condition. After farrowing, feed a good milk-producing ration consisting of green feed, crushed grain, and skim milk. Grain and water alone are unsatisfactory. A sow with a litter should always have water available. It is not necessary or advisable to keep a sow with litter confined in a small sty. If good shelter is available, better results will be obtained by allowing the sow to graze about a week after littering.

Oat Varieties for Southern Yorke Peninsula.

Weavers Agricultural Bureau asks "What varieties of oats can be sown for green feed in the Weavers District?" Mr. R. C. Scott (Supervisor Experimental Work), in reply to this question, says varieties of oats which may be recommended for planting for green feed at Weavers are Early Kherson or Fulghum. These oats make rapid early growth and recover rapidly after grazing. When sown for feeding off, a relatively heavy seeding is advisable, and approximately 2bush. per acre should be planted.

Prices for Wheat Sold to the East.

Upper North Conference (Wepowie Branch) asks "Why is it never disclosed at what price F.A.Q. wheat is sold to the East?"

This question was submitted to the Secretary of the Chamber of Commerce, who says when wheat is sold on the Baltic Exchange in London it is usual for prices to be disclosed, but this practice is not followed out when wheat is sold to other countries, particularly the Orient, where the buyers, who are chiefly Japanese and Chinese, and keen competitors, demand that prices remain secret.

HORTICULTURAL INQUIRIES.

[Replies supplied by A. G. STRICKLAND, M.Sc., Deputy Chief Horticultural Instructor.]

Splitting of Oranges.

Frayville Agricultural Bureau asks the cause of oranges splitting.

Reply—The factors involved in the splitting of oranges are not clearly defined. It is thought, however, that irregularity of water supply is a very frequent cause of the trouble. Prolonged dry periods, with partial drying out of fruit, tend to increase certain gummy substances within the fruit; these gummy substances (or pentosans) increase the water-absorbing capacity of the tissues, so that when water is available in quantity, the tissues may swell so rapidly by absorption of water that the rind cannot stand the internal pressures which are set up. Under these circumstances, *i.e.*, a period of some water shortage, followed by rain or irrigation, splitting may occur. Weather conditions which may favour splitting are, of course, largely beyond control, but where irregular watering is a possible factor, this feature can be remedied to some extent by keeping the soil at optimum moisture content all the time.

Peas as an Orchard Manure.

Rendelsham Agricultural Bureau asks—(1) *At what stage should the pea crop be ploughed in to be of the greatest benefit?* (2) *Is it advisable to grow peas around fruit trees and then plough them in?* (3) *Are peas preferred to artificial manure?*

Replies—A green crop of peas should not be regarded altogether as a substitute for artificial fertiliser applications. It is true that a leguminous cover crop is able during its growth to fix nitrogen from the air, and when the crop is ploughed under, such nitrogen ultimately becomes available as plant food. Nevertheless, even where cover crops are ploughed under, there may still be need for the application of quickly-acting artificial fertilisers at certain periods of the year.

For instance, though green cropping is a standard feature of citrus culture on Murray Valley soils, it is also standard practice to apply fairly heavy dressings of a quickly-acting nitrogenous fertiliser, such as sulphate of ammonia, at critical periods in the tree cycle, *e.g.*, just prior to blooming and fruit setting. Although certain other fruits may not exhibit such marked response to well-timed applications of artificial fertilisers as does citrus, it is nevertheless a fact that even where regular green cropping is practised, good results may, in some instances, follow the use of quickly-available artificial fertilisers applied at the proper time, *i.e.*, in practically all types of fruit in late winter or early spring.

Furthermore, when sowing a leguminous green crop in early autumn, it is always advisable to use a moderate dressing of superphosphate at the same time. Peas, beans, etc., respond to such a dressing, and will usually repay the outlay in fertiliser by producing a bigger bulk of material for ultimate incorporation with the soil.

From the foregoing, it is apparent that green cropping does not necessarily do away with the necessity for applying artificial fertilisers, where and when required. But even more important is the fact that use of artificial fertilisers will not relieve growers of the responsibility of maintaining the humus content of their soils by means of regularly incorporating organic matter of some kind. This organic matter is essential, and be it supplied in the form of farmyard manure, by growing and ploughing under green crops, or even by encouraging natural weed growth by means of light broadcast fertiliser applications in autumn and subsequently incorporation of the encouraged weed growth, the regular addition of organic matter to the soil cannot be neglected without ultimate loss of fertility.

The stage at which any sown green crop (or perhaps, adventitious crop of miscellaneous herbage) should be ploughed under is sometimes dictated by practical considerations. Nevertheless, it should be the aim of every grower to incorporate the cover crop at least a month before the fruit trees enter the period of early growth, blooming, and setting.

It is during this period that the trees make maximum demand for nitrogen and, although green crops (especially leguminous) may ultimately contribute towards higher levels of soil nitrogen, there is for some weeks after incorporation of such a green crop, a marked decrease in the soil nitrogen level. For a period, then, trees may be actually nitrogen starved, and it is most undesirable that this period of potential nitrogen starvation should coincide with the period of early growth, flowering, and setting. Duly recognising practical considerations, early ploughing under of the green crop is the best policy.

Grubs in Potatoes.

Pinnaroo Women's Branch asks "What is the cause of grubs getting into potatoes before they are dug."

Reply—The grubs referred to in this query are probably the larvae of the potato moth, which may damage the tubers either before or after harvest. The moth is usually more active in hot and dry seasons.

Spraying the plants in the field does not appear to be of great assistance, but it has been demonstrated that fine mulching of the soil will help to protect tubers from the grub. Soils of a clay nature, if not well cultivated, will crack, and through the tiny fissures thus formed the grub may gain access to the potatoes.

At harvest time, immediately the tubers are exposed, the moth will, in favourable seasons, lay eggs thereon. The eggs hatch within a few days and the larvae enter the tubers. Some experiments carried out by the Victorian Department of Agriculture have shown the effectiveness of "tuberol" (an emulsified oil compound) in preventing damage. If the moth is particularly active at digging time, potatoes should be sprayed with tuberol at a strength of 1gall. in 30galls. of water; this treatment will minimise extensive damage whilst the tubers are stored.

If grubs are already in the potatoes they should be dipped in a tuberol solution of the above strength for 30 minutes. This latter treatment will not affect the tubers in so far as human consumption is concerned.

Upper North Conference. The Wilmington Branch asked "How to make a plum tree bear fruit."

Reply—The tree blooms normally, but sets very little fruit. This indicates that it is probably failing, due to lack of cross-pollination.

The flowers of many plum varieties will not produce fruit if fertilised with pollen of the same variety, and for maximum cropping it is necessary for such flowers to be fertilised by pollen of another suitable plum variety—the exchange of pollen being effected by bees or other insects.

The necessary facilities for such cross-pollination are usually provided by interplanting two or more compatible plum varieties which bloom simultaneously, or whose blooming periods overlap sufficiently to enable cross-fertilisation.

The plum tree in question is of unknown variety, and it is, therefore, impossible to suggest a suitable polleniser until the tree is named. Nevertheless, the inquirer may be able to determine a suitable polleniser in the following manner. When the tree is in bloom, obtain from another plum tree of different variety, and which is also in bloom, several flowering branches; immerse these branches in a tin of water and suspend the bouquet and tin from a limb of the recalcitrant plum tree. This procedure may greatly increase the setting, and, if so, the variety from which the bouquet was obtained may be regarded as a suitable polleniser. If possible, more than one variety may be used and bouquets hung in different parts of the tree. Observation of the amounts of fruit set in the vicinity of the different bouquets will then indicate which is the best polleniser.

Having, in the above manner, decided on a suitable polleniser, permanent cross-pollination facilities may be provided by planting a tree of the pollenising variety alongside the non-bearing tree, or, if preferred, by working one or two limbs of the non-bearing tree to the pollenising variety.

VETERINARY INQUIRIES.

Upper North Conference: "What quantity of carbolic acid and sweet oil is required to make a carboliser to dress wounds on animals?"

Reply—One ounce of strong liquid carbolic acid to 1 pint of olive oil. To be well shaken before application.

"Tantanoola" reports sheep with slimy discharge from mouth, listless, and moves with staggering gait.

Reply—The symptoms described as being shown by the affected sheep point to some form of toxaemia rather than plant poisoning, though from the information given, it is impossible to say the cause of it. Should another case occur, the following treatment might be tried if it can be given in the early stages:—Give the sheep a drench of 10 grains of permanganate of potash dissolved in quarter pint of water. Two or three hours later give quarter pint of raw linseed oil. Subsequently give twice daily on the back of the tongue as much powdered nux vomica as will go on a sixpenny piece.

"Lameroo" has aged mare very shaky in front legs following being allowed to graze in a paddock of self-sown wheat and oats.

Reply—The mare was affected with so-called grass founder. Take her off the grass and feed on dry feed mostly, with only a limited allowance of green feed daily. Give her a drench of raw linseed oil, 1½ pints; turpentine, 4 tablespoons; and subsequently give a clenched handful of Epsom salts night and morning in the feed. Dissolve this in a little water and use it to damp the feed with. Also give 1 tablespoon of Fowler's solution of arsenic in the feed night and morning for a fortnight.

"Secretary Agricultural Bureau, Balumbah," reports horse with severe cut on the inside of hind leg. Bleeding was stopped by tying a piece of silk around the cut artery.

Reply—Provided the wound is clean and the silk ligature was tied and cut off short without leaving long ends, the artery will heal without any further trouble.

"Nott's Well" reports mare 9 years old, discharge from small hole on the bottom eyelid. Matter is also discharging from the nostril.

Reply—The condition present would appear to be one of abscess formation in the sebaceous glands of the eyelid. The discharge through the nose is matter that is coming from the eye down the tear duct, which runs from the eye into the nostril. It would be advisable to call in a qualified veterinary surgeon to attend to the animal, as some surgical interference may be necessary. Failing this, get from the nearest chemist some aqueous solution of iodine (made up to one-quarter the strength of B.P. tincture) and an ounce of 1 per cent. yellow oxide of mercury ointment. Clean out all matter from the eye sac and from the external wound on the lid by bathing with lukewarm boracic lotion. Then gently syringe out the opening of the wound on the outside of the lid with a little of the iodine solution. Finally, place a small piece of the ointment (about the size of a small pea) inside the lower lid, and hold the two lids together with the fingers for a minute or two to allow the ointment to melt and spread over the eye. Repeat the treatment daily.

ALMOND TREES IN IRRIGATION AREAS.

"Caloote, River Murray," asks for information concerning the planting of almond trees. Mr. E. Leishman (District Horticultural Instructor), to whom the inquiry was submitted, says if it is intended to plant the trees on the high land, consisting of a deep, sandy loam over marl or limestone, the conditions should be ideal where irrigation can be carried out. It is essential in this climate in the early years of the trees that they must not suffer from the want of soil moisture. Frequent irrigation in the early stages, say, from two to three years, is necessary to establish the trees. Varieties suitable for the district are Chellaston, Hatch's Nonpareil, and I.X.L.

PASTURE IMPROVEMENT IN SOUTH AUSTRALIA.

[By R. C. Scott, Supervisor of Experimental Work, and E. M. Hutton, Field Officer.]

INTRODUCTION.

The study and application of the principles of pasture improvement are essential for the most profitable production of animal products, such as wool, meat, and milk, especially in high rainfall districts. In general, the higher the rainfall the less suitable is the district to cereal production, and the greater the suitability to intensive livestock husbandry with pasture improvement as the basis.

For successful pasture improvement in any district, due regard must be paid to choosing the right pasture plants, and the right strains of those plants, to correctly balanced pasture mixtures of those strains, to correct fertiliser treatment, and above all to the proper utilisation of the pasture growth obtained.

A correctly balanced pasture mixture, which consists of one or more legumes grown in association with one or more grasses, is an advantage from the point of view of fertilising practice and animal nutrition.

Pasture grasses are only productive when plentifully supplied with phosphorus and nitrogen, whereas pasture legumes which obtain atmospheric nitrogen through the agency of bacteria located in their root nodules need only be supplied with phosphorus for full productivity. The nitrogen fixed by the bacteria of legumes becomes distributed throughout the plant, and so becomes available to the grazing animal, which returns approximately 50 per cent. of this nitrogen to the soil in its droppings. The soil is further enriched in nitrogen when the remains of leguminous plants, especially the root nodules, decay. Thus, for full production, a grass-clover pasture needs only adequate annual phosphatic top-dressing and proper management.

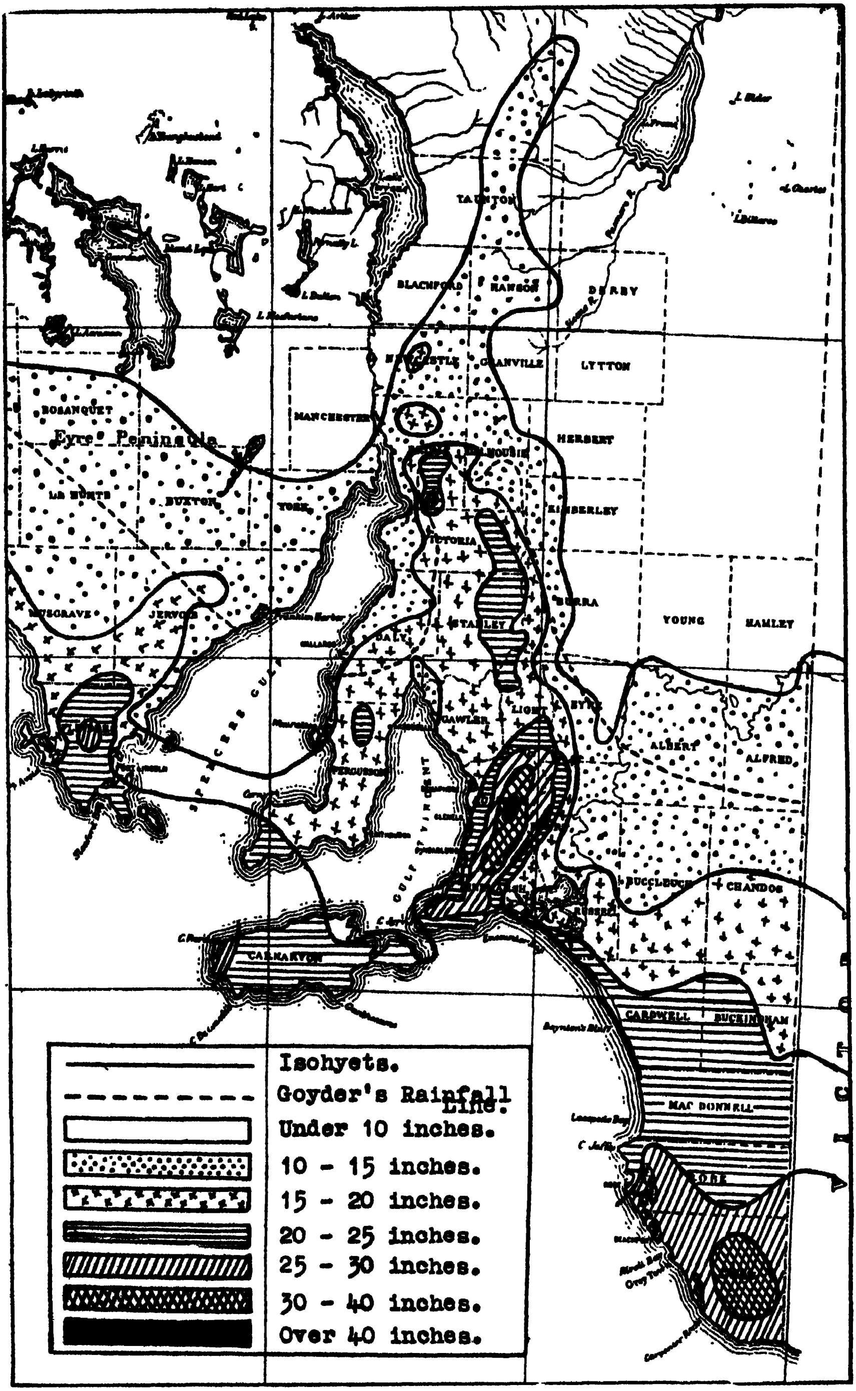
Pasture improvement would be very expensive without legumes, because in their absence nitrogen becomes a limiting factor to plant growth in the uncultivated areas of low to medium rainfall districts, and also in the high rainfall districts due to leaching and conditions unfavourable to the development of nitrogen bacteria.

In recent years it has been found that the mineral content of pastures is just as important as their energy value, so that legumes with their high nitrogen and mineral content need to be properly balanced with grasses in a pasture, to secure best results with the grazing animal.

A. THE PASTURE DISTRICTS OF SOUTH AUSTRALIA.

The South Australian climate has been classed as Mediterranean, that is to say, one in which a period of liberal winter rainfall is succeeded by a summer drought, the period of stress coinciding with the period of high temperatures. South Australia is the driest State in the Commonwealth, since it has the highest percentage (91 per cent.) of land receiving less than a 15 inch annual rainfall, and the lowest percentage receiving more than this quantity per annum. In addition, South Australia has the smallest acreage amenable to intense pasture development, because within its boundaries there is a lesser area on which the rainfall exceeds 20 inches per annum than is the case in any other State in the Commonwealth. The 13,000 acres of Irrigated Murray Swamps in country receiving less than a 15 inch rainfall are certainly a help in making up our deficiency of true pasture land.

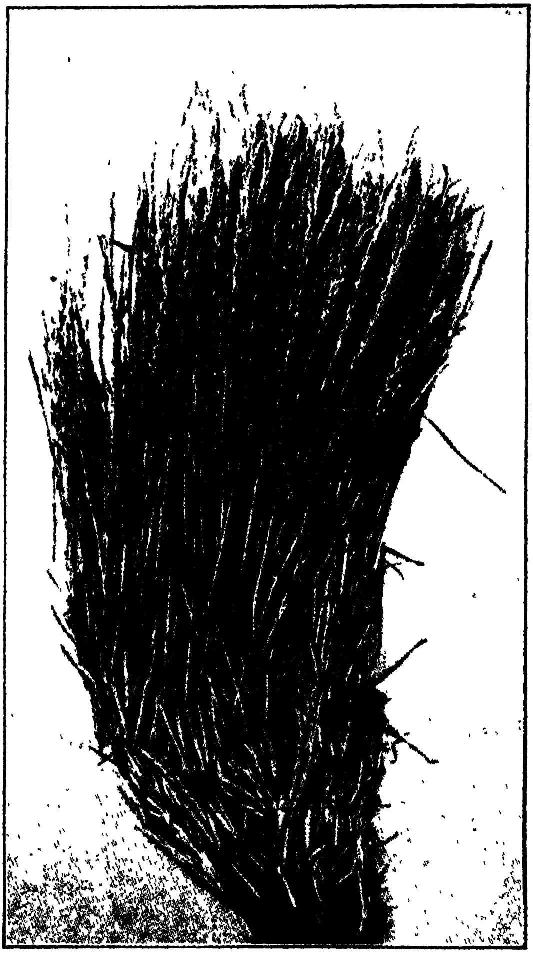
From the foregoing it is obvious that if we are to compete successfully with the other States in intensive livestock husbandry, we must develop to the fullest extent the pastures in the areas receiving greater than a 15 inch rainfall. In this connection it is necessary to concentrate on the Murray Swamp lands and the areas



Map showing rainfall areas of South Australia.

recording more than a 20 inch annual rainfall. Trumble and Davies (*Journal Council Scientific and Industrial Research,* August, 1931) have shown that there are three distinct pasture areas in South Australia, each requiring different treatment, namely:—

(1) The winter cereal cultivation belt receiving 15 inches to 25 inches per annum.
(2) The area of relatively liberal or extended precipitation receiving more than 20 inches to 25 inches per annum.
(3) The irrigated Murray Swamps.



Wimmera Rye Grass.

[From Vic. *J. Agric.*]

B. PASTURE IMPROVEMENT IN THE CEREAL CULTIVATION COUNTRY.

The main cereal cultivation country is confined to the area between the 15 inch and 25 inch rainfall lines. Here winter rainfall and summer drought are clearly defined. From about the end of April until the end of September liberal and effective winter rains are recorded, this period coinciding with a pronounced drop in monthly temperatures. From the beginning of October until the beginning of April, the relatively light rainfall is rendered more or less ineffective by the summer temperatures.

In this area pasture improvement must fit in with cereal production, and as a result, must of necessity be mainly of a temporary nature. Where cows and horses are the main animals to be fed, hay, ensilage, and natural grassland fill the requirements. However, with the present low prices of cereals, many farmers have turned more and more to sheep, and consequently pasture improvement is finding a definite place in the farming practice.

In the past, many farmers have found that oats and Superphosphate drilled on to wheat stubbles were one of the best ways of increasing the value of the grazing in the year following the wheat crop. Such forage oats can be grazed as green feed, portion being reserved to build up a supply of grain or hay to be fed later. In addition, it is now recognised that the most useful pasture plants in this area are Wimmera Rye Grass, Lucerne, Burr and Barrel Medics, and Evening Primrose, with the addition of *Phalaris tuberosa* and Dwalganup Early Subterranean Clover where the rainfall is 18 inches or more. However, *Phalaris tuberosa* would only be used when a permanent pasture is thought desirable.

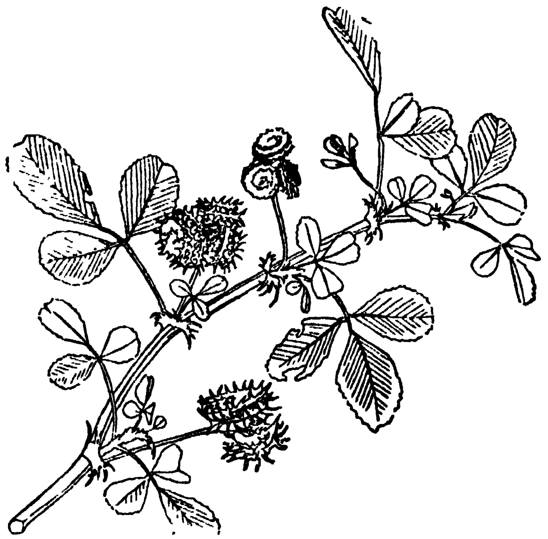
Lucerne.

I. The Main Characteristics of the Pasture Plants Important in the Cereal Cultivation Country.

WIMMERA RYE GRASS (*Lolium* sp.).—This is a free seeding annual forage plant very well adapted to temporary pasture conditions in the cereal cultivation country. It is very palatable and nutritious, even when dry. It is sown with the first autumn rains and develops during the winter and spring, the greatest bulk of growth being made in the spring. McDougall strain is reliable seed to purchase. There are about 200,000 seeds in a pound. The price varies between about 4½d. to 6d. per pound.

LUCERNE (*Medicago sativa*).—This is a drought-resistant perennial legume particularly well suited to the relatively dry conditions of the cereal belt. It thrives best where underground water is within reach of its deep taproot system, or where irrigation can be practised. In addition, sufficient lime in the soil is necessary for development. It is especially valuable because its main period of growth is during the summer. It is only of use where a permanent or three or four year pasture is desired. Lucerne seed is about 1s. 6d. to 2s. per pound, 220,000 seeds being in a pound. The best variety is the Australian lucerne, of which the strain known as Hunter River is typical.

BURR MEDIC (*Medicago denticulata*) and BARREL MEDIC (*Medicago tribuloides*).—These are very important naturally occurring annual legumes, particularly in the drier parts of the cereal cultivation country. They build up nitrogen in the soil, and provide abundant winter and spring feed, particularly if stimulated by topdressing with superphosphate. The burrs provide nutritious summer feed. The price of seed approximates 1s. per pound.



Burr Medic.

[From Leaflet No. 6, N.Z. Dept. Agric.]

EVENING PRIMROSE (*Oenothera odorata*).—This is a biennial with a deep taproot system. It is particularly valuable because it will produce nutritious fodder on very poor sandy soil, which is practically useless for cereal cultivation. It is sown with the first autumn rains, and the main growth is made during the spring and summer months. The seed is about 2s. 3d. per pound.

PHALARIS TUBEROSA.—This is a valuable drought-resistant perennial fodder with a root system which penetrates deeply into the subsoil, but needs at least an 18 inch rainfall for persistence. It produces feed with the first autumn rains, and the winter production is good compared with other pasture plants, which tend to make the bulk of their growth in the spring. It is very resistant to grazing. *Phalaris tuberosa* is sown in the autumn, and although making rather slow growth in the first season, improves considerably in the second year. It is very susceptible to weed competition in the seedling stage. Being a perennial, it does not fit in well with cereal rotations, so should only be planted if seed production or a permanent pasture is the aim. Seed commands about 5s. per pound, 300,000 seeds being in a pound.

DWALGANUP EARLY SUBTERRANEAN CLOVER (*Trifolium subterraneum*).—This is the best associate clover, especially on sandy soils, for Wimmera Rye Grass, Evening Primrose, and *Phalaris tuberosa* where the yearly rainfall is 17-18 inches or more. It is an annual with a prostrate habit and ability to bury its seeds. It is sown in autumn and makes the bulk of its growth in late winter and spring. This strain of Subterranean Clover flowers early (August) and is able to set its grain before the hot dry summer weather affects development. At present the seed is about 1s 6d. per pound, there being approximately 70,000 grains to a pound.

II. The Main Divisions of the Cereal Cultivation Belt.

The three main divisions of the cereal cultivation belt are:—

1. Areas receiving less than a 17-18 inch average annual rainfall.
2. Areas receiving from 17-25 inch average annual rainfall.
3. Areas with ground water close to the surface.

Evening Primrose.

[From Black's *Flora S. Aus.*]

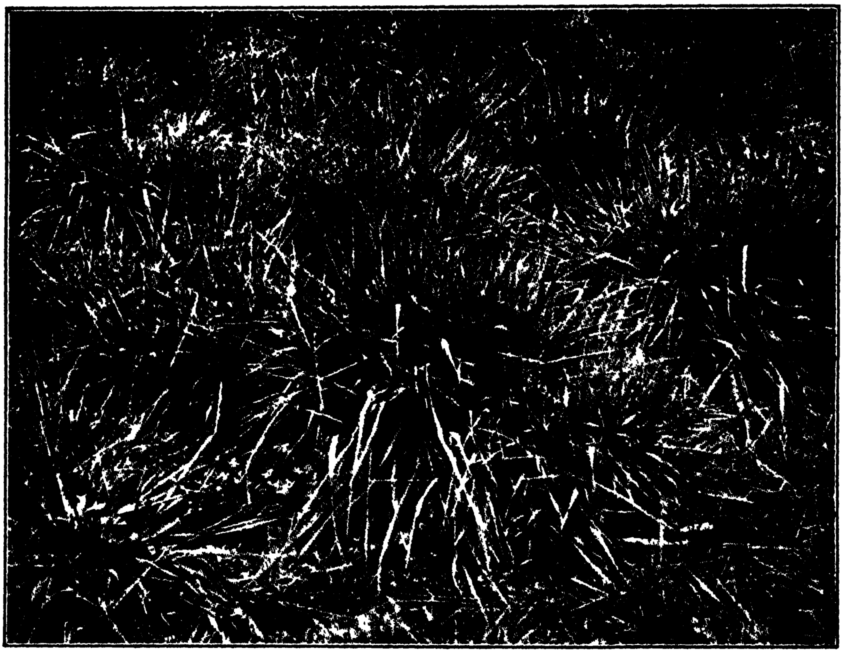
The Lower Rainfall Mallee Areas.

Poor sandy rises which have not been so denuded of vegetation as to be subject to drift can be made to provide quite an appreciable amount of valuable sheep feed if 1lb. of Evening Primrose (*Oenothera odorata*) and not less than ½cwt. of Superphosphate is broadcasted over each acre at the time of the first autumn rains. Annual dressings of Superphosphate will not only keep up the productivity of the Evening Primrose, but will encourage the Burr and Barrel Medics (sometimes wrongly called Burr "Clover").

On land used for cereal production, Wimmera Rye Grass (*Lolium* sp.) may be planted instead of forage oats to improve the pasture in the grazing year following a wheat crop. Wimmera Rye Grass can easily be established by sowing about ½lb. per acre of the seed mixed with the superphosphate when the wheat crop is drilled in. A light seeding such as this will not compete seriously with the cereal plants. At harvest time the Wimmera Rye Grass seed gathered by the machine will be blown out of the back of the harvester to provide a relatively heavy seeding for the next year.

Adequate phosphate dressings stimulate the Burr Medics, which not only produce a good bulk of fodder, but also build up soil nitrogen which is necessary for the best development of Wimmera Rye Grass. If the area is to be left out to pasture for two years, at least one topdressing of Superphosphate and a cultivation with the first autumn rains is essential. Spelling the Wimmera Rye Grass in late spring to allow of seed setting may be necessary where there is likelihood of it being eaten out. Wimmera Rye Grass, together with the burrs of the Medics, form excellent dry feed for stock in the summer months.

Wimmera Rye Grass is never likely to become an aggressive competitor of wheat crops, because it can be readily kept in check by a clean fallow. In districts where Takeall is bad, the displacement of Barley Grass by Wimmera Rye Grass in pasture land (apart from the added feeding value) is a great advantage, since the former is susceptible and the latter non-susceptible to the disease.

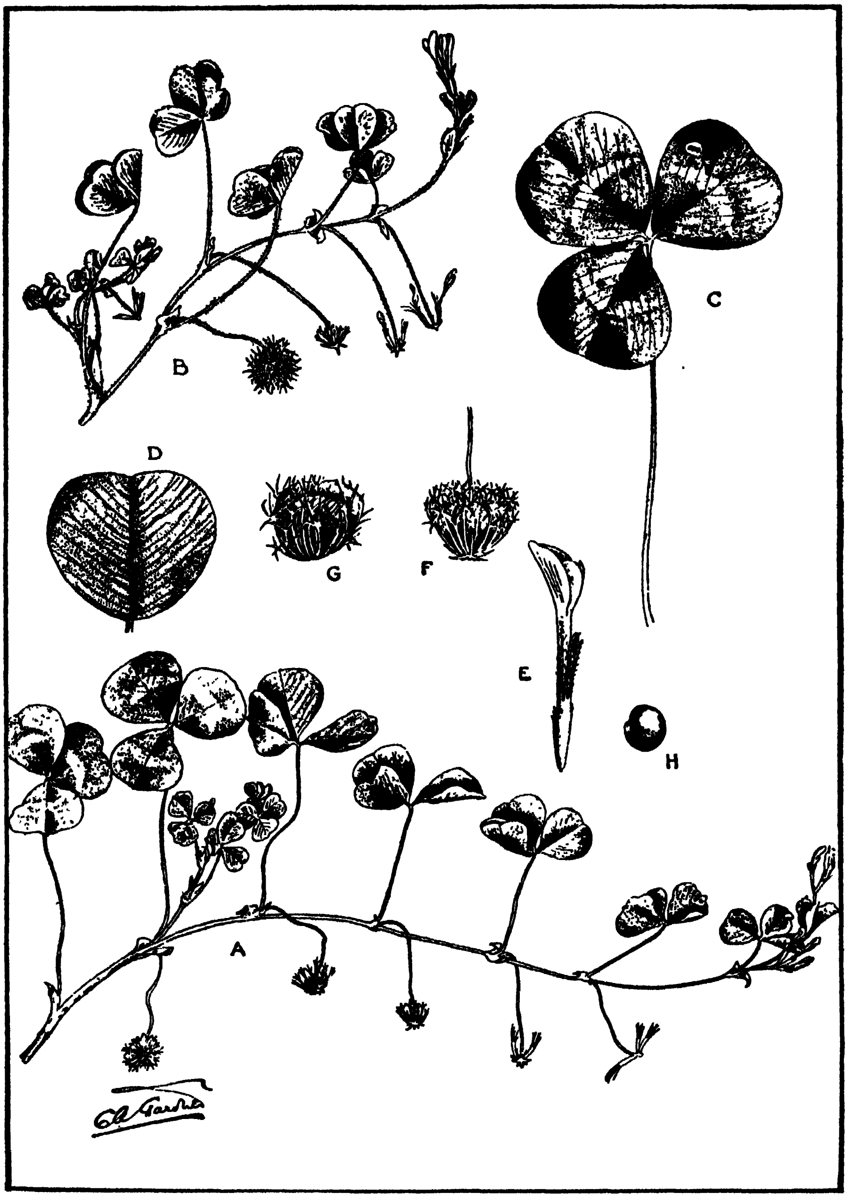


Phalaris tuberosa showing winter development.
[From C.S.I.R., Bull. 66, by A. E. V. Richardson, M.A., D.Sc., H. C. Trumble, M.Agr.Sc., and R. E. Shapter, A.A.C.I.]

The growing of Lucerne may be profitable in these areas if the pasture land is left out for at least three or four years. On the light sandy mallee soils which are liable to drift 4lbs. Lucerne seed and ¾cwt. Superphosphate distributed through the manure box on to a cereal stubble in the autumn is the best method of establishment, whilst the addition of 1 to 2lbs. of Wimmera Rye Grass will greatly increase the pasture production. On heavy soils bare fallowing for a whole season with cultivation and cultipacking is essential for success. Under these conditions about 6lbs. Lucerne seed (and 1 to 2lbs. of Wimmera Rye Grass if desired) with 1cwt. Superphosphate drilled shallowly through the manure-box in autumn would produce a good pasture.

Wheat Growing Areas Receiving 17-25 Inches Annual Rainfall.

On very poor sandy soils which are not suitable to cropping, a good mat of feed would be produced from a mixture of 1lb. Evening Primrose and 2 or 3 lbs. of Early Subterranean Clover and about 1cwt. Superphosphate per acre drilled through the manure-box. Annual topdressing at the rate of a bag of Superphosphate to 2 acres is necessary to keep up the productivity of the pasture.



Western Australian Early Subterranean Clover. A and B—Showing habit and development. C—Leaf, showing cream arches. E—Flower. F—Maturing seed head. G—Ripe burr with 3 pads. H—Seed.

[From W.A. *J. Agric.*]

On the better class land 8lbs. of Lucerne seed, with or without 1 to 2lbs. of Wimmera Rye Grass, sown with 1cwt. of Superphosphate after adequate preparation, will produce a good pasture. Dwalganup Early Subterranean Clover can be introduced with advantage, especially on sandy soils, where an area is to be left out to pasture for two or three years. An excellent annual pasture can be established by drilling on to cereal stubbles in the autumn a mixture of 2 to 3lbs. Wimmera Rye Grass, 3 to 4lbs. Early Subterranean Clover, and 1cwt. of Superphosphate to the acre. The productivity of such a pasture can be maintained by spelling in late spring to allow of seed setting, by topdressing with 1cwt. of Superphosphate, and cultivating each autumn with pasture harrows.

Since *Phalaris tuberosa* is a perennial pasture plant, it should not be established on land which is to be cropped in the near future. Where a perennial pasture producing good autumn, winter, and spring feed is desired, a mixture of 3lbs. of *Phalaris tuberosa* and 4lbs. of Early Subterranean Clover with at least 1cwt. of Superphosphate per acre will give excellent results. This mixture should be seeded in early autumn on a well-worked fallow free of weeds. With perennial plants like *Phalaris* an even stand over the surface of the land is desirable. This can be obtained by removing the drill tubes and allowing the seed to fall on a sloping board fixed below the seed runs, the seed being covered by light harrows attached behind the drill. During the first year the pasture should be lightly grazed to reduce weed competition. After that, however, *Phalaris tuberosa* will withstand heavy grazing without damage, but for full productivity, at least 1cwt. of Superphosphate should be applied annually. This not only encourages the *Phalaris tuberosa* directly, but also indirectly, because of the nitrogen made available following the stimulation of the associate Early Subterranean Clover.

***Phalaris tuberosa*—Western Australian Early Subterranean Clover Pasture at Gepp's Cross.**

[By courtesy of H. C. Trumble, Waite Institute.]

As *Phalaris tuberosa* seed averages about 5s. per lb., seed production is often a profitable side line. If seed or hay is the aim, spelling the pasture from mid-spring is desirable. Harvesting is carried out when the top of the seed head is ripe. It will be found that various modifications of the harvesting machinery are required to prevent loss of seed, and a fair return appears to be about 100 to 120lbs. per acre.

To make nutritious hay from *Phalaris tuberosa*, it must be cut just when the flower-heads begin to appear. If cut too late, the hay is coarse, light, and unpalatable.

Cereal Areas with Ground Water Close to the Surface.

In these areas, with underground water within 4 to 12 feet of the surface, as between Burra and Mannanarie, Lucerne growing and Lucerne seed production is profitable, good stands sometimes lasting for 30 years.

On the heavy soils of the Northern flats the land must be thoroughly prepared, and if weedy, it should be ploughed in early winter and treated as bare fallow until seeding in the following autumn. If the land is relatively free from weeds, winter ploughing with several cultivations would prepare the soil for a spring seeding while the soil is moist. In either case cultipacking of some kind is essential to produce a good seed-bed. In seeding, 12lbs. of seed and 2cwts. of Superphosphate should be mixed and shallowly drilled through the manure-box on each acre. On the other hand, the seed and manure can be broadcasted over the surface, and then lightly harrowed in. On light sandy soils liable to drift, as around Lake Albert, 9lbs. of seed with 1 to 1½cwts. superphosphate per acre, mixed and drilled on to a cereal stubble in the autumn is preferable to sowing with a cover crop. Cover crops, such as oats, are undesirable, since they compete for plant food and light with the lucerne and tend to crowd out and weaken plants grown in association with them.

Where lucerne is grown mainly for grazing in this cereal area, a mixture worthy of trial consists of 2 to 4lbs. of *Phalaris tuberosa,* and 6 to 8lbs. of Lucerne sown in the autumn on a well-cultivated and cultipacked fallow. The seed should be mixed with a dressing of 1½ to 2cwts. of Superphosphate per acre, and provision made for even distribution behind the drill. Such a pasture should be judiciously grazed during the first year. With a Lucerne or Lucerne-*Phalaris* pasture which is to be permanent, an annual autumn topdressing of 1½ to 2cwts. of Superphosphate and the subdivision of the area into small paddocks of not more than approximately 20 acres will greatly increase the carrying capacity. In addition, permanent lucerne pasture benefits appreciably from a July or August cultivation, a rigid tine cultivator with narrow shares being used, whilst on light sandy soils a good harrowing will answer the purpose.

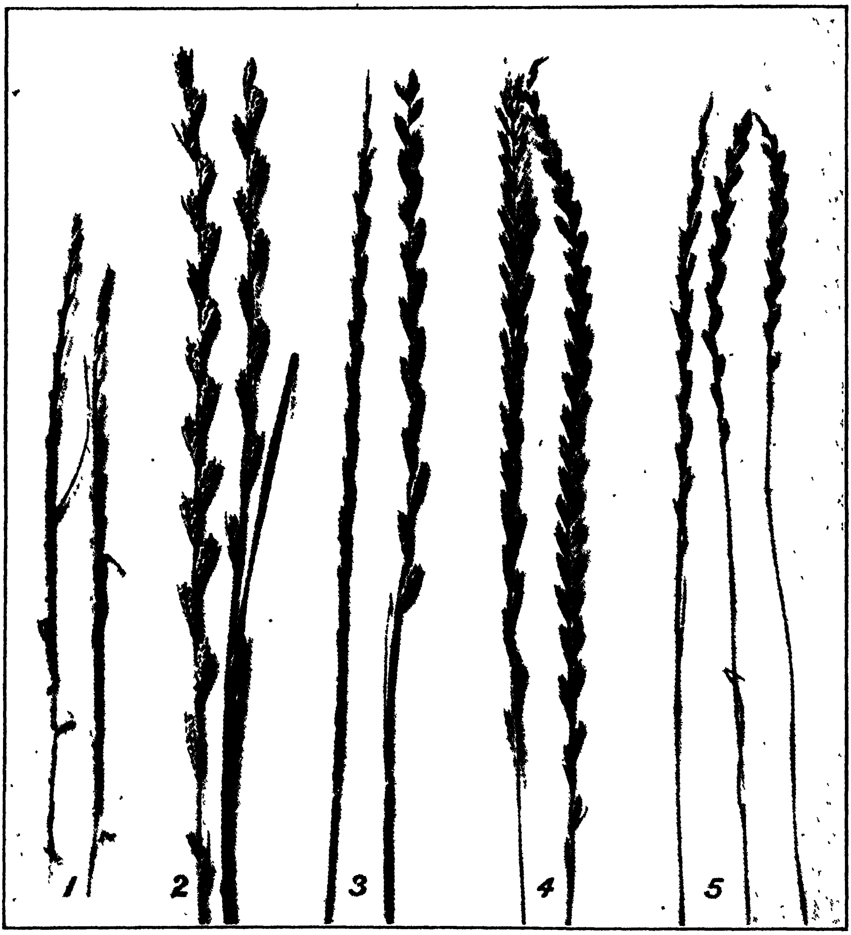
C. PASTURE IMPROVEMENT IN THE AREAS OF LIBERAL OR EXTENDED RAINFALL INCLUDING THE SUBTERRANEAN CLOVER COUNTRY.

This area is characterised by cool temperate spring and early summer conditions due to either a heavy or extended rainfall. Of the cereals, oats do well in this environment, but for the most part such localities are entirely unsuited to the ordinary cropping as practised in the Northern districts of South Australia. The area receiving mild, moist, early summer weather is practically confined to the Mount Lofty Ranges, together with the Mid and Lower South-Eastern districts of the State. Pasture production in all its phases is the most profitable agricultural practice for such lands.

The pasture plants most suited to these areas are Wimmera Rye Grass, Perennial Rye Grass, *Phalaris tuberosa*, Mount Barker Subterranean Clover, White Clover, Strawberry Clover, and in special cases Yorkshire Fog.

The Main Characteristics of the Useful Pasture Plants in the Liberal or Extended Rainfall Areas.

WIMMERA RYE GRASS (*Lolium* sp.).—The main characteristics have been mentioned previously. This grass can be grown with success anywhere, except under waterlogged conditions. With Subterranean Clover, it forms the ideal mixture for bracken fern areas.



Species of Rye Grass. (1) Rigid Rye Grass (*Lolium rigidum*). **(2) Drake Grass** (*Lolium temulentum*). **(3) Wimmera Rye Grass** (*Lolium sp.*). **(4) Italian Rye Grass** (*Lolium multiflorum*). **(5) Perennial Rye Grass** (*Lolium perenne*).
[After F. R. Drake, Vic. *J. Agric.*]

PERENNIAL RYE GRASS (*Lolium perenne*).—This is the most valuable perennial grass for temperate conditions. It is very resistant to grazing, and will produce rich, nutritious feed most of the year if moisture is available. For productivity and persistence, it needs rich, dark soils high in nitrogen. It is an ideal grass for dairying conditions. Sowing with the first autumn rains is the best procedure.

Each pound of seed contains about 250,000 seeds, and a pound costs about 7½d. It is always best to buy certified perennial seed, since many of the uncertified strains are short-lived and non-persistent under grazing. The best strain at the present time is New Zealand Certified Perennial Rye Grass. In addition there are many local strains of Perennial Rye Grass which have persisted for a long period in the Adelaide Hills, and other parts of the State, and if these strains were developed, supplies of seed from good type plants suited to South Australian soil and climatic conditions could quickly be made available.

PHALARIS TUBEROSA.- The characteristics of this valuable grass have been mentioned previously. It will persist on both first and second class soil, but yields more palatable and a greater quantity of fodder when planted on the former type. It is not as palatable as Perennial Rye Grass in the green state, but when made into hay is relished by stock. Like Perennial Rye Grass, it will produce green feed most of the year. It should be sown in the early autumn on a well-prepared piece of land free from weeds. A light dressing of Subterranean Clover may be added to the mixture, but Perennial Rye Grass should not be included, as it has a strong depressing effect on the establishment of *Phalaris tuberosa.*

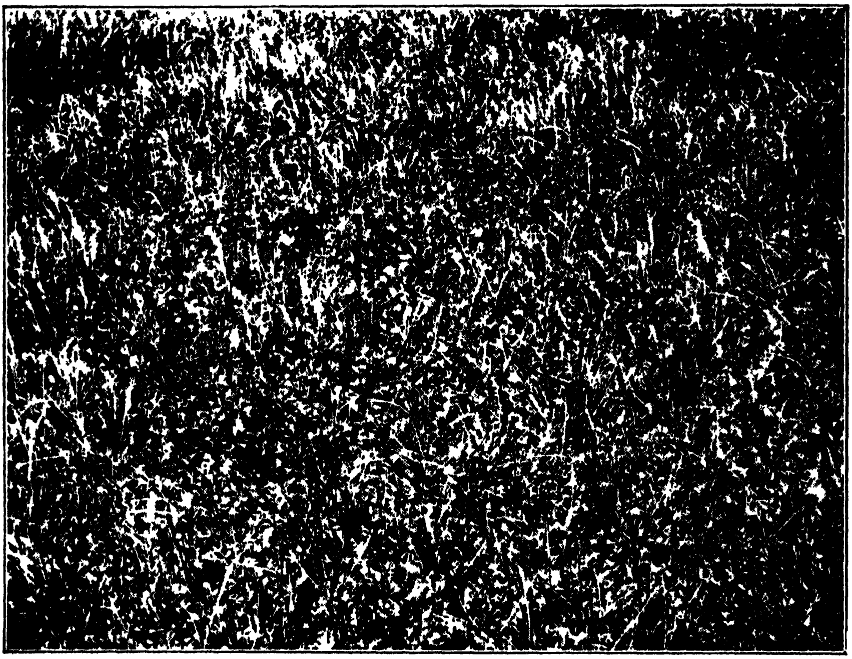
Mount Barker Late Subterranean Clover

[From *Fodder Crops for Australia*, L. H. Brunning.]

LATE SUBTERRANEAN CLOVER (*Trifolium subterraneum*).—This is the standard clover for the large area of land situated in the cool temperate districts of South Australia. On rich black soils which are highly charged with lime, such as are to be found in parts of the South-East, Subterranean Clover does not thrive, its place being taken by Strawberry and White Clovers, but, on the other hand, it makes strong abundant growth on low fertility soils, provided that adequate phosphatic manures are added and must be regarded as the most valuable pasture variety in this State. Because of its seed-burying habits it is very persistent, and with the assistance of superphosphate is capable of transforming poor sandy soils into dark friable land, which in the course of time becomes suitable for carrying Perennial Rye Grass. Subterranean Clover can be established on land which is still only partially cleared, since further tillage in the autumn to destroy the bushes or eradicate stumps will not affect the germination of the seed which is lying dormant in the ground at that time of the year.

It should be sown in the autumn, and whilst responding to good tillage, a sound soil preparation is not so essential as is the case with many other varieties, provided that the seed is buried. A pound contains 70,000 seeds, and on the local market costs about 1s.

WHITE CLOVER (*Trifolium repens*).—White Clover is only suited to rich soils which are moist during the spring and summer months, since it makes its maximum growth during this period. There are many rich moist pockets of land in the Adelaide Hills which grow White Clover very well. It is a perennial with a creeping, rooting stem. Because of its smooth palatable leaves it is often badly attacked by Lucerne Flea. The price of certified seed is about 3s. 6d. a pound, each pound containing approximately 730,000 grains. New Zealand Certified Wild White Clover is a good strain to purchase.



Perennial Rye Grass—Late Subterranean Clover pasture at Mount Barker.

STRAWBERRY CLOVER (*Trifolium fragiferum*).—This is a very palatable perennial clover with rooting stems, which makes its growth in the spring and summer. It is particularly adapted to marshy localities and rich swampy low-lying land. On the black partially drained soils of the South-East Strawberry Clover has been found to thrive extremely well. A pound of seed is about 6s. This clover contains about 90 per cent. hard seeds, and unless the grain is rubbed between two large sheets of emery paper or some similar substance, the germination may be very poor. Sowing at a very shallow depth in the autumn will give the clover a chance to become well established and withstand the first summer.

YORKSHIRE FOG (*Holcus lanatus*).—This soft hairy perennial grass is a useful pioneer on raw peat and poorly drained areas where the rainfall is liberal and extended. Stock have to acquire a liking for it, and its feeding value is lower than that of Perennial Rye Grass. The price of seed is 6d. a pound, each pound containing approximately a million seeds.

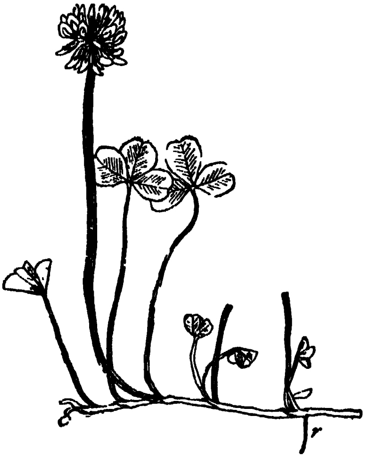
The Main Pasture Divisions in the Liberal or Extended Rainfall Areas.

In these areas, soil fertility, and not rainfall, is the main factor governing the direction which pasture improvement will take. Taking this into consideration, the main pasture divisions are:—

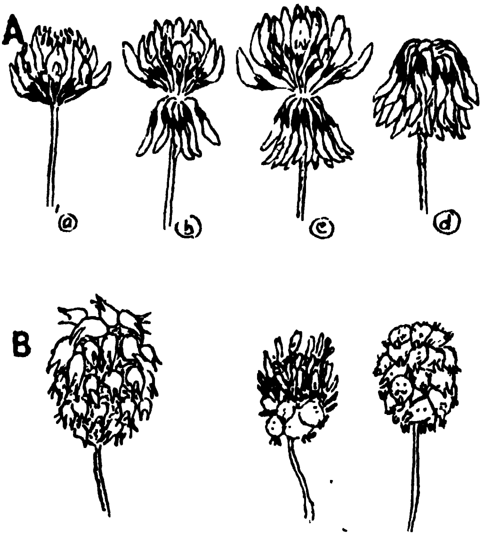
1. Gray and white sands, gray and red sandy loams, and poor gravelly soils. Ironstone patches are a common occurrence in these soil types. They are found commonly in the Adelaide Hills and portions of the South-East, the red sandy loams being practically confined to the latter area.

2. Red shotty ironstone in large areas, such as on Kangaroo Island.

3. Gray loams, which are often greasy and sticky at the surface when wet. These are found in the apple growing areas of the Adelaide Hills, and in the country through to Victor Harbour.



Portion of white clover plant showing creeping habit of stem and root "r."
[After Percival.]



A—The various stages in the turning down of the flowers of the White Clover flower head.
B—The characteristic bladdery appearance of a mature Strawberry Clover flower head.
[After A. Morgan, Vic. *J. Agric.*]

4. Gray silty soils which puddle very easily in the winter. Clay is usually found within 9 inches or a foot of the surface. These soils are frequently in large flat areas, and are particularly amenable to pasture development. They occur in the Meadows, Echunga and Myponga districts, and in large areas in the Mid South-East, as at Kybybolite.

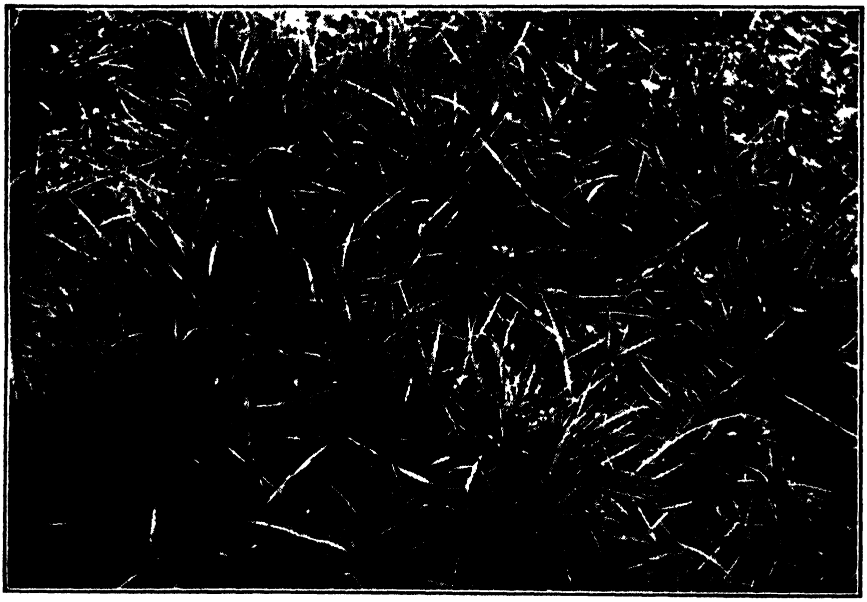
5. Old Subterranean Clover land, as at Mount Barker.

6. The drained black lands of the South-East, as between Millicent and Naracoorte.

7. Moist dark flats, peaty swamps, and marshy localities. The two former are often found in gullies of the Adelaide Hills.

Pasture Development on the Poor Gray and White Sands, Gray Sandy Loams, and Poor Gravelly Soils.

With these soil types the main aim should be to increase the organic matter, and so improve their water and nutrient retaining powers. Many of these areas are only just being cleared and opened up, due no doubt to present economic conditions. The cheaper the cost of clearing and establishment the better. On heath country the usual procedure is to roll and burn all undergrowth and small eucalypts, the larger eucalypts being hand-cut or rung. Yacca plants can be eradicated in the winter by pouring kerosene into the heart of each plant. About 8galls. kerosene will treat 1,000 yacca plants. (R. Hill, *S.A. Journ. Agric.*, Jan., 1931.) When the land is relatively clear, a shallow but thorough cultivation to stir up the surface layers is beneficial. If the soil is deeply ploughed, the thin layer of organic matter and soil nutrients in the top portion would be buried, and raw unproductive soil exposed. The area should then be sown in the autumn with 3lbs. or 4lbs. of Mount Barker Subterranean Clover and 2cwts. of Superphosphate per acre and the seed properly buried by harrowing. In big gum country the addition of 3lbs. to 4lbs. of Wimmera Rye Grass to the mixture would be an economic proposition. In general, these poorer soils do not develop clover well until the second or third year, and it is probably advisable to wait until then before Wimmera Rye Grass is introduced. These converted virgin areas should be regularly hand-grubbed until no more gum shoots, &c., appear Annual autumn harrowings, and topdressings of at least one bag of superphosphate per acre, are essential for full development of the clover. After about eight to ten years the soil is frequently darkened in colour, when Perennial Rye Grass may be introduced. When adding the Perennial Rye Grass the soil should receive a good autumn cultivation, 5lbs. or 6lbs. of Perennial Rye Grass then being broadcasted and harrowed in, or drilled in shallowly with the Superphosphate.



A good pasture mixture comprising Perennial Rye Grass and White Clover.

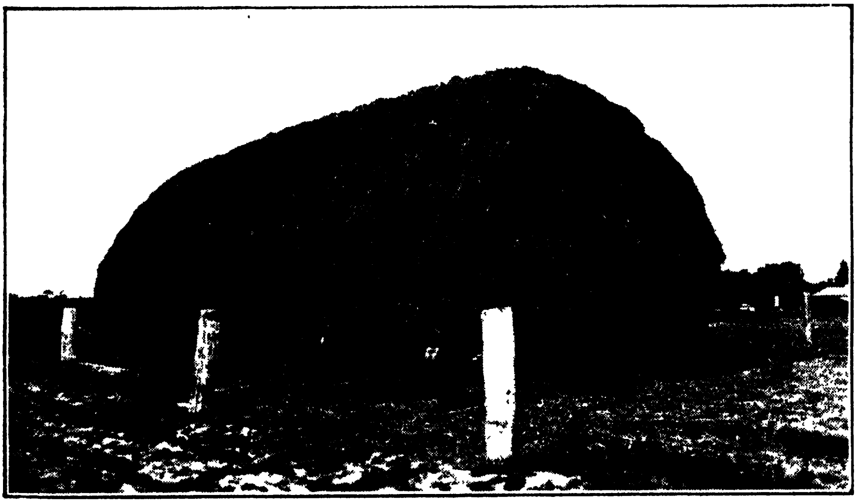
Bracken fern areas can be cut with a mower, and then given a good cultivation or shallow ploughing in readiness for sowing. In the autumn 5lbs. or 6lbs. of Wimmera Rye Grass and 4lbs. or 5lbs. of Mount Barker Subterranean Clover with 2cwts. of Superphosphatee can be drilled on to the land each year. Such areas need a topdressing of at least one bag of Superphosphate to the acre together with a harrowing. Stock grazing on such pastures are continually breaking off the young bracken shoots, and the fern is gradually eradicated.

Pasture Development on Red Shotty Ironstone Country.

Areas of this country occur throughout the Adelaide Hills, and particularly on Kangaroo Island. This type of soil is necessarily costly to develop, because of its lack of organic matter, coarseness of particles, and its large phosphatic requirement. On Kangaroo Island its use for grazing is a necessary adjunct to successful stock-raising, since the herbage it carries cures the coastiness developed on much of the other country in the vicinity.

To develop shotty ironstone country, 4lbs. or 5lbs. of Ordinary Subterranean Clover with 2cwts. of Superphosphate per acre should be drilled in or broadcasted and harrowed after a good autumn cultivation. Every autumn liberal dressings of at least a bag of Superphosphate per acre, together with a good cultivation, will keep up the productivity of the pasture. After three or four years 5lbs. or 6lbs. of Wimmera Rye Grass per acre could be introduced with the autumn cultivation and topdressing. As previously mentioned, the permanence of a Wimmera Rye Grass-Subterranean Clover pasture depends on autumn cultivation, topdressing, and spelling in late spring to allow for good seed setting.

When the shotty ironstone soil has been developed for a number of years, it may be possible to establish *Phalaris tuberosa* successfully.



A well built stack of grass hay.

Pasture Development on Gray Loams which are often Sticky at the Surface when Wet.

These soils are fairly fertile, the main drawback being their stickiness in the winter. As a result they are rather cold, and pasture growth is very slow during the winter. By establishing Subterranean Clover, the stickiness disappears as the organic matter in the surface layers is built up.

These sticky gray loams should receive a thorough cultivation in the autumn before a pasture is sown. A good pasture mixture for each acre would be 4lbs. Mount Barker Subterranean Clover, 6lbs. Wimmera Rye Grass, and 1 bag of Superphosphate. The permanence of the Wimmera Rye Grass will depend on correct pasture management on the lines which have been already outlined.

A permanent pasture should be the aim, since it will provide feed for a longer period than an annual one. This can be obtained by sowing 5lbs. or 6lbs. of Perennial Rye Grass in the manner previously described after one of the autumn cultivations. Perennial Rye Grass could be sown with the Wimmera Rye Grass in the first place, but it is advisable to wait a few years until the soil is in good condition. Pastures of *Phalaris tuberosa* could be developed instead of Perennial Rye Grass. The seed-bed should be very well prepared, and freed from weeds, and a mixture of 3lbs. or 4lbs. of *Phalaris tuberosa* and a bag of Superphosphate sown to the acre. During the first year only light grazing should be given, but in the second season this pasture should withstand normal treatment.

Pasture Development on the Gray Silts.

Typical areas of this country are to be found in the Meadows, Echunga, Myponga and Mid South-Eastern districts. These lands develop excellent pastures. In their natural state they frequently carry red gums, and at Kybybolite are often described as red gum flats. The cleared virgin soil is of gray silt at the surface, and possesses a clay layer, often containing shotty ironstone, at a depth of about 9 inches to a foot. The soil is cold, wet, and easily puddled in the winter. Organic matter and plant nutrients are always low in such soils. A bulk of feed is usually produced late in the year, when the soil begins to warm up.

Such areas should be given a shallow ploughing followed by good cultivation, and in the autumn sown with 4lbs. or 5lbs. Mount Barker Subterranean Clover and a bag of Superphosphate over each acre. The addition of 5 or 6lbs. of Yorkshire Fog to the mixture may be of use for a preliminary grassing, especially under waterlogged conditions.

If an ordinary Subterranean Clover pasture has been developed by topdressing for a number of years, it can be made more productive and better balanced by the introduction of either Wimmera Rye Grass, Perennial Rye Grass or *Phalaris tuberosa*. Wimmera Rye Grass or Perennial Rye Grass can be introduced by sowing 5lbs. or 6lbs. of seed per acre after a good autumn cultivation. The former being an annual, will withstand less fertile conditions than the latter, and is preferable for planting in the early years, following the reclamation of such land from natural conditions.

Phalaris tuberosa at the rate of 1 to 2lbs. of seed per acre may be planted early in the autumn after a thorough cultivation. However, during establishment *Phalaris tuberosa* is very susceptible to competition from either Perennial Rye Grass or strong growing weeds, and therefore should be sown alone in the Subterranean Clover and superphosphate mixture.

Old Subterranean Clover Land.

In these areas, such as at Mount Barker, there are many plants of the so-called natural Perennial Rye Grass, and after annual topdressings of the Subterranean Clover a gradual natural development of Rye Grass results. However, to quickly establish Perennial Rye Grass a good autumn cultivation, followed by the sowing of 8 to 10lbs. of Perennial Rye Grass, with a bag of Superphosphate per acre will establish a good pasture.

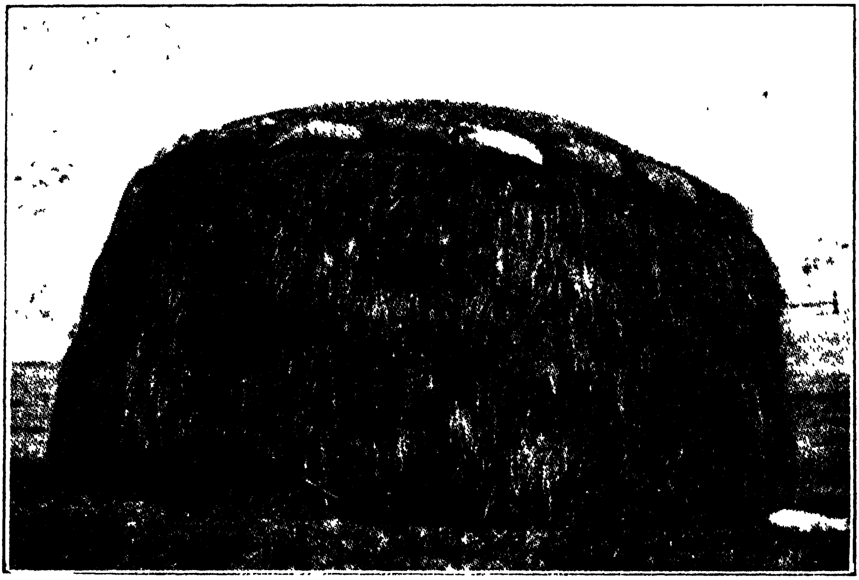
This area is essentially suited to perennial grasses, and Perennial Rye Grass is the best for these conditions. However, should a variety in pasture growth be desired, *Phalaris tuberosa* could be added in place of the rye grass.

The Drained Black Lands of the South-East.

These rich black soils are high in organic matter, friable when dry, but become unworkable when wet. Since they lie in a region where the annual rainfall varies from 22.59in. at Naracoorte to 29.76in. at Millicent, the form of pasture improvement will vary according to circumstances.

It has been found that Subterranean Clover is a failure on much of this black land. On the other hand, Strawberry Clover is ideally suited to the conditions, and excellent swards of this fodder can be found growing alongside many of the roads. At Coonawarra the New Zealand Wild White Clover has not withstood the dry summer weather as well as Strawberry Clover, with the result that this variety fails to persist. In the Millicent area, however, where the rainfall is nearly 30in., both the Strawberry and White Clovers thrive.

Perennial Rye grass is well suited to these black soils, whilst recently good results have been obtained from the planting of *Phalaris tuberosa*. In the preparation of such land for pastures the best procedure is to plough in the early summer before the annual grasses have seeded, work the soil up and sow 1in. to 1½in. deep at the time of the first autumn rains. Deep seeding is best on these friable soils because the surface dries out so quickly. The loss of late summer and autumn grazing consequent on this procedure would be compensated for by the better pasture resulting. The best pasture mixture for the drained black land is 4 to 5lbs. New Zealand Certified Perennial Rye Grass, ½lb. to 1lb. Strawberry Clover, and 1½cwts. Superphosphate. As an alternative, 2 to 3lbs. of *Phalaris tuberosa* may be used to replace the Perennial Rye Grass.



A silage stack weighed down with soil which is kept in position by bags of soil placed around the edges

It is very important that the Strawberry Clover seed should be rubbed between large sheets of glass or emery paper before being sown. This process wears off the tough outer skin and enables water to penetrate the seed, thus ensuring a quicker and higher germination than would otherwise be the case.

In the wetter portion of the black land region, as, for example, in the vicinity of Millicent, 1 to 2lbs. New Zealand Certified Wild White Clover added to or substituted for Strawberry Clover in the mixtures given will be an advantage, whilst the general practices for the planting of the pasture as outlined previously will also apply.

Moist Dark Coloured Flats, Peaty Swamps and Marsh Localities.

Dark flats which remain moist throughout the year, and are not badly waterlogged during the winter, will produce good pasture. A suitable mixture is 6lbs. of Perennial Rye Grass and 2lbs. of White Clover, with 1½ to 2cwts. of Superphosphate to the acre. This could be conveniently sown in the early autumn or spring.

On raw peats which are springy underfoot and on poorly drained areas of good quality, a mixture of 8 to 10lbs. of Yorkshire Fog and 2lbs. of White Clover, with 1½ to 2cwts. of Superphosphate to the acre, gives the best results. Perennial Rye Grass only thrives where the plant structures of the peat have been thoroughly decomposed with the formation of a dark consolidated soil.

Where the soil is swampy or inclined to be brackish, Strawberry Clover should be established. If the surface is relatively free from waterlogging, 1 to 2lbs. of Strawberry Clover to the acre broadcasted on the surface in the early autumn (using sand or Superphosphate, preferably the latter, as the broadcasting medium) will eventually give a good stand. If the soil is saturated practically all the year, it would be better to establish the Strawberry Clover by means of cuttings set out in the autumn.

Pasture Management in the Liberal or Extended Rainfall Areas.

When sowing pastures, seed and Superphosphate should only be mixed as required, since the germinating power of seed is reduced when left in contact with Superphosphate for any length of time.

In the first year permanent pastures should be judiciously grazed to give them every chance for healthy development. It appears that most perennial pasture plants, such as *Phalaris tuberosa,* White Clover, Strawberry Clover, and to a lesser extent Perennial Rye Grass, need at least a year to become firmly established.

Annual pastures such as Wimmera Rye Grass and Subterranean Clover should always receive an autumn cultivation to prepare a suitable seedbed for the germination of the seeds. Spelling of the pasture in late spring is often necessary to ensure a good seeding of Wimmera Rye Grass.

With all pastures, an annual topdressing of 1 to 2cwts. of Superphosphate, depending on soil fertility, should be given with the first autumn rains. Many landholders prefer to apply their superphosphate in the spring, while others again apply dressings both in the autumn and spring. However, whilst two applications may be of advantage, it would appear that where only one dressing is given, autumn is the correct period for treatment, so as to encourage the growth of herbage at a time of the year when pasture development is relatively slow.

Repeated applications of sulphate of ammonia to a well-balanced grass-clover pasture depresses the clover development and lowers production. On the other hand, this fertiliser assists in establishing pasture on poor quality land which has not previously carried a good clover crop, and under such circumstances the addition of ½cwt. of sulphate of ammonia to the usual phosphatic dressing is an advantage.

When good pastures have been established subdivision into areas of 15 to 20 acres and the practice of systematic grazing will greatly increase the stock-carrying capacity of the farm. Following this intensive system of pasture production, light harrows or some appliance designed by the landowner should be used after each grazing to break up and distribute the dung over the whole paddock. It will be found that this will be most readily accomplished after a rain when the dung is moist and easily broken. This procedure is absolutely necessary, especially when cattle are kept, in order to prevent the growth of rank unpalatable patches of pasture.

Although little experimental work has been done with pasture renovation in South Australia, it is recognised that an annual or biennial surface cultivation in the autumn with pasture harrows greatly improves production.

When the flush of growth commences in the spring the period between grazings of each paddock should be shortened, and a number of fields closed up for meadow hay or ensilage. By so utilising the flush of growth in the spring, the maximum number of stock may be carried throughout the whole of the year. The pasture is ready to cut for ensilage shortly after the clovers have passed the period of full bloom, and the grasses are well out in head. ("The Manufacture and Utilisation of Silage" is fully described in Bulletin No. 274 of the Department of Agriculture by W. J. Spafford. This Bulletin should be in the possession of everyone interested in pastoral work.)

In making meadow hay the time of cutting depends largely on the botanical composition of the pasture. If Subterranean Clover dominates the growth, it should be cut when the base leaves of the clover commence to yellow and there are plenty of seed burrs at the surface of the ground. If grass predominates, the growth should be cut soon after it has headed. When the weather is fine at haymaking, the crop should be mowed when the dew has dried from the herbage, and immediately raked into windrows; whilst within a few hours it may be built into cocks. If the weather is particularly dry, the material should be cocked as soon as possible after cutting, whilst if the pasture has to be cut when wet, it should be left in the swath until the surface dries before being raked into windrows.

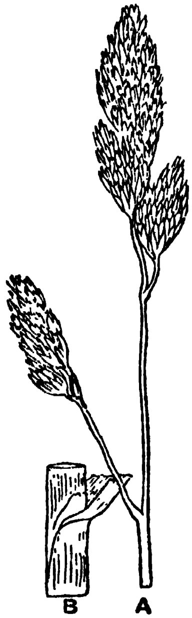
PRAIRIE GRASS.

[From *Grassland and Green Crop Farming*, Yates.]

To facilitate handling and to hasten curing, the cocks should not be more than a forkful in size, and the hay stacked or baled as soon as it is cured. If a handful of material taken from the centre of the cock will not exude sap when twisted tightly, although it may feel moist, it will be ready to stack or press. If stacked when too moist, it will develop moulds and decompose, such decomposition often resulting in spontaneous combustion. In some seasons weather conditions are not favourable for the proper curing of hay, and under these circumstances the addition of about 40lbs. of salt to the ton will check fermentation and the development of moulds, resulting in the curing of a very palatable Brown Hay, provided that the fodder is not too damp at the time of stacking. If possible meadow hay should be stored in sheds, because exposure to the weather results in deterioration.

D. PASTURE IMPROVEMENT ON THE IRRIGATED MURRAY SWAMPS.

This area of about 13,000 acres provides a special problem. An 11 to 14 inch annual rainfall mainly received in the winter is obtained. During the dry period from October to May frequent irrigations are necessary for successful plant growth. The soil is a very rich clay containing a high percentage of organic matter, and as a result yields herbage especially rich in nitrogen. Where permanent Perennial Rye Grass pastures have been established, it often happens that the green herbage is so rich and unbalanced, especially in nitrogen, that the digestive systems of cows and sheep are upset, with the result that these animals scour badly and fall away in condition. In the past, lucerne was the main fodder crop, usually being mown and fed to cows as either green stuff, hay, or ensilage. With the low prices ruling for milk products it has become necessary to eliminate as much as possible the handling of fodder, with the result that permanent pastures now predominate on the Murray Swamps.



Cocksfoot showing (a) seed head, and (b) base of leaf blade.

It has been found that the most useful pasture plants for the Murray Swamps areas are Prairie Grass, Perennial Rye Grass, Cocksfoot, *Phalaris tuberosa,* Kentucky Blue Grass, White Clover, Montgomery Red Clover, Italian Rye Grass, Perennial Red Clover or Cow Grass, and Lucerne.

The Main Characteristics of the Pasture Plants Important on the Murray Swamps.

PRAIRIE GRASS (*Bromus unioloides*).—Under Murray Swamp conditions this is one of the best grasses, giving excellent winter and summer growth, and a good bulk of early autumn feed. It acts as a biennial, and together with its free seeding habit forms a permanent pasture. Under grazing it develops a well-balanced grassy sward in association with the wild White Clover of the swamps Such a pasture is a useful change from one containing the richer Perennial Rye Grass. Investigations by officers of the Waite Institute indicate that plots of Prairie Grass raised from commercial seed have not been satisfactory on the swamps. When purchasing seed, therefore, it would be advisable to obtain it from swamp settlers who have productive and persistent swards of this grass. The usual price per pound is about 5d., 50,000 seeds being contained in a pound. The best time to sow is in the autumn.

Perennial Rye Grass (*Lolium perenne*).—This is a highly nutritious and productive perennial grass which is very persistent under grazing. Its only drawback is its richness under swamp conditions. Unless properly managed it may cause scouring and digestive trouble in animals. As mentioned previously, New Zealand Certified Perennial Rye Grass costing about 8d. a pound is the best strain, and autumn the most suitable time for planting.

Cocksfoot (*Dactylis glomerata*).—This perennial grass is very useful for inclusion in autumn-sown pasture mixtures containing Perennial Rye Grass. Its main period of growth is during the spring, summer, and autumn. On the Murray Swamps, Cocksfoot does not reach full development until about the third year. A pound of seed costing 1s. 4d. to 1s. 7½d. contains 500,000 seeds. New Zealand Akaroa Cocksfoot is the best strain to purchase.

A—Giant Colonial Cow Grass, and B—Red or Broad Clover.
[From *G. and N. Catalogue*, 1934.]

White Clover (*Trifolium repens*).—The swamp conditions are well suited to the growth of this clover; in fact, many blocks tend to become overrun with a wild strain. As mentioned previously, Certified New Zealand Wild White Clover costing 3s. 6d. a pound is the best strain to sow in a pasture mixture.

Montgomery Red Clover (*Trifolium pratense*).—This is a prostrate strain with a longer life than ordinary Red Clover, and promises to have a definite place in pasture mixtures on the Swamps. A pound of New Zealand Certified Montgomery Red Clover containing 218,000 seeds costs 3s. 6d.

Giant Colonial Cow Grass or Perennial Red Clover (*Trifolium pratense perenne*).—This is a more vigorous and longer-lived strain than the ordinary Red Clover. Together with Italian Rye Grass it makes the best temporary pasture for the Swamps. It is mainly a spring and summer grower, and needs well-drained conditions in which to thrive. It is more adapted to cutting than grazing. A pound of seed containing 218,000 grains is 1s. 6d. It can be sown in the autumn or late winter.

PHALARIS TUBEROSA.—The main characteristics of this grass have been mentioned previously. It will not establish and grow well in conjunction with Perennial Rye Grass on the Swamps. When sown alone with White Clover there is a tendency for weeds to develop between the *Phalaris tuberosa* plants. Kentucky Blue Grass (*Poa pratensis*) grows well with *Phalaris tuberosa,* and forms a sward which prevents the ingress of weeds. On the fertile swamps, *Phalaris tuberosa* unless kept closely grazed, quickly becomes rank and unpalatable. It should always be autumn sown.

KENTUCKY BLUE GRASS (*Poa pratensis*).—This fine-leaved grass, possessing creeping stems, grows mainly during the autumn, winter, and early spring. As mentioned above, it appears to have a definite place in a *Phalaris tuberosa* pasture. The seed commands about 2s. a pound, each pound containing 1,860,000 seeds.

ITALIAN RYE GRASS (*Lolium multiflorum*).—Together with Red Clover, this forms a very satisfactory temporary pasture. It is a biennial under these conditions, and produces heavy summer yields. It is better adapted to cutting than grazing. A pound of seed is about 4d. and contains 270,000 seeds.

LUCERNE (*Medicago sativa*).—The main characteristics of this plant have been mentioned earlier. Under mowing conditions on the swamps, Lucerne stands will last for about 10 years, but a few years of grazing will soon thin out the stand.

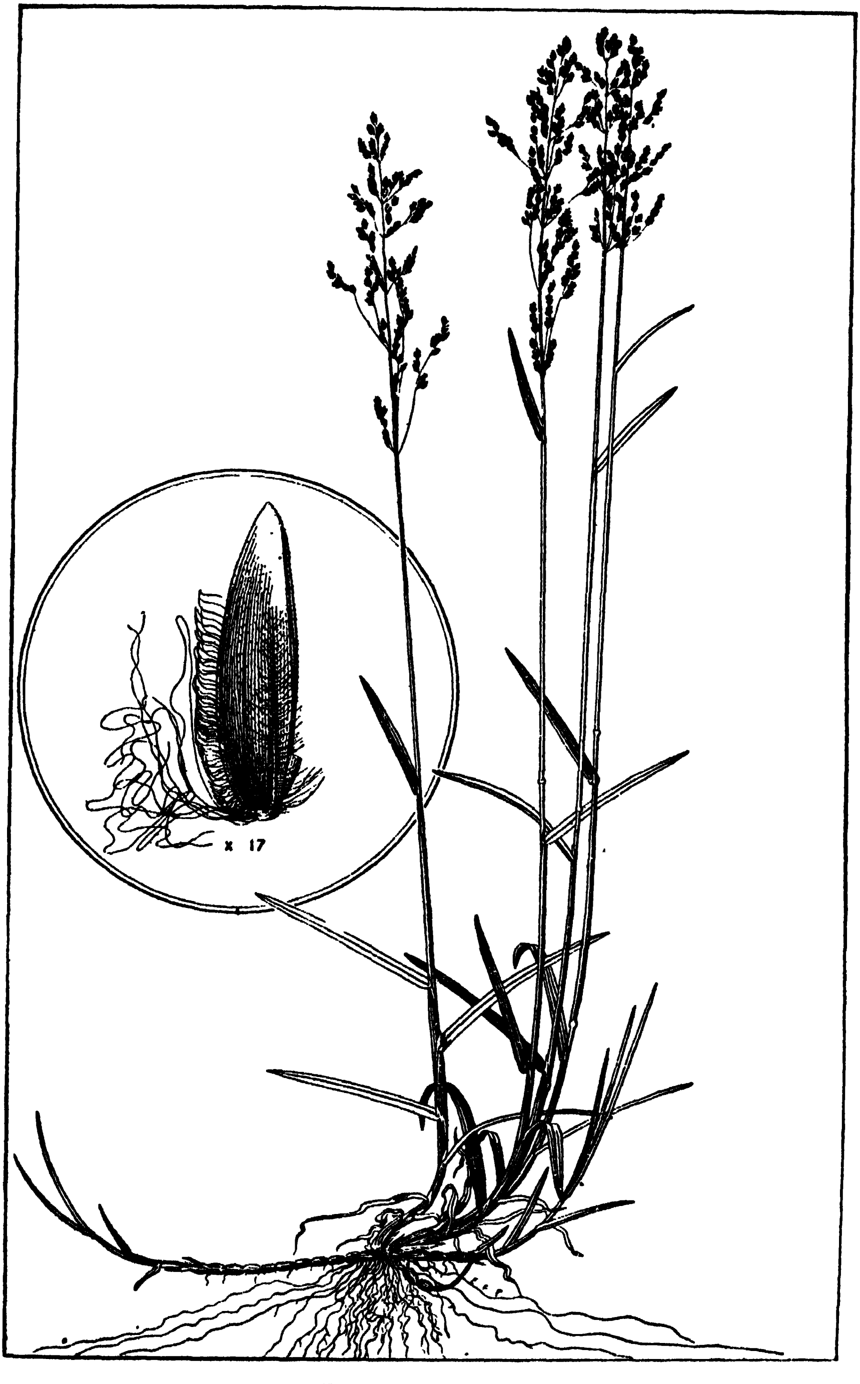
Pasture Establishment on the Irrigated Murray Swamps.

All pasture seeds should be sown on a well-prepared seed-bed at a time when the young seedlings will not be scorched by the hot sun. Autumn and early spring, preferably the former, are the main seeding periods. On the Murray Swamps the natural rainfall is so uncertain that it is wise to irrigate the land beforehand to ensure a good germination. As soon as the land can be worked after the irrigation, a good seed-bed should be prepared, and the seed and superphosphate sown. If the land is very weedy, an irrigation to germinate the rubbish should be given, and these weeds destroyed before proceeding with the seeding operations. The question of a further irrigation after planting will depend entirely upon the character of the season, but if the weather should prove hot and dry, resulting in danger of a poor germination, the land should again be watered.

As a result of investigations conducted by the Waite Agricultural Research Institute, Mr. H. C. Trumble, M.Agr.Sc., in his article, "The Establishment and Management of Irrigated Pastures" (*Journal of Agriculture,* S.A., March, 1934), recommends the following mixtures for establishing permanent pastures on the Murray Swamps:—10lbs. Certified Perennial Rye Grass, 8lbs. Akaroa Cocksfoot, 2lbs. Certified Wild White Clover (and when available 2lbs. Montgomery Red Clover), 1½ to 2cwts. Superphosphate; or 4lbs. *Phalaris tuberosa,* 4lbs. Kentucky Blue Grass, 2lbs. Certified White Clover (and when available 2lbs. Montgomery Red Clover), 1½ to 2cwts. Superphosphate The second pasture mixture is quite safe as regards scouring, but the first may cause trouble unless carefully managed. A pasture seeded down with 12lbs. of Prairie Grass, 2lbs. of Certified Wild White Clover, and 1½ to 2cwts. Superphosphate will make a useful change from richer pastures.

The best temporary pasture for seeding under these conditions consists of 8 to 10lbs. of Italian Rye Grass and 5lbs. of Red Clover (Cow Grass), together with a bag of Superphosphate per acre.

When planting Lucerne, 20lbs. of seed and 2cwts. of Superphosphate should be sown to the acre on a well-prepared seed-bed. Autumn is the best time for seeding, as when planted at this period of the year a highly productive stand is secured in the summer.



Kentucky Blue Grass

[From *Grasses and Fodder Plants of N.S.W.*, by E. Breakwell.]

Pasture Management on the Irrigated Murray Swamps.

For the successful utilisation of pasture growth under these fertile conditions subdivision and rotational grazing is essential. By this means pasture growth is not wasted, and the stock-carrying capacity is greatly increased. The grazing areas should be subdivided, so that according to the number of stock carried each can be grazed about every four weeks. The pasture growth in these paddocks should be regularly fed off by placing a large number of stock into each of them successively for about a week at a time. Thus every field is grazed down at intervals of from five to six weeks. After grazing, each paddock needs some kind of harrowing to distribute the droppings, as if the dung is allowed to accumulate in patches, rank unpalatable growth will result.

During the cold winter period pasture growth will be at a minimum, with the result that unless hay or ensilage is available, the stock-carrying capacity of the area will also be at a corresponding level. In the flush of spring feed is usually abundant, and the normal number of stock are often unable to cope with the fodder produced. Consequently a number of fields would be reserved for harvesting as hay or ensilage, and the animals turned into the remaining paddocks at more frequent intervals. At about flowering time the pasture growth in the closed areas can be cut for hay or ensilage. The material so conserved is available for hand-feeding during the lean periods of the year, and the stock-carrying capacity maintained at its maximum.

In addition, annual applications of about 2cwts. of Superphosphate and frequent summer irrigations are necessary. At present many of the settlers find that they can only use the irrigation water at wide intervals. This is a serious disadvantage, and if full pasture production is to be obtained, ability to water every two to three weeks, especially during the hot months of the year, is essential.

SUMMARY.

1. A knowledge of the principles of pasture improvement is essential for maximum returns from agricultural areas in South Australia.

2. The South Australian climate is not particularly favourable to pasture development inasmuch that a period of liberal winter rainfall is followed by summer drought accompanied by high temperatures and great evaporation.

3. There are three distinct pasture areas in this State namely: 1. The Cereal Cultivation Belt. 2. The areas receiving more than 20 inches annual rainfall. 3. The Irrigated Murray Swamps.

4. The most useful pasture plants in the cereal cultivation country are Wimmera Rye Grass, Lucerne, Burr and Barrel Medics, Evening Primrose, *Phalaris tuberosa,* and Dwalganup Subterranean Clover.

5. The main divisions of the Cereal cultivation country are: 1. Areas receiving less than 17-18 inches average annual rainfall. 2. Areas receiving more than 18 inches average annual rainfall. 3. Areas with ground water close to the surface.

6. For the lower rainfall cereal-growing areas the most valuable varieties are: Evening Primrose, Wimmera Rye Grass, and Lucerne.

7. For the higher rainfall cereal-growing areas the most valuable varieties are Evening Primrose (for poor sandy soils), Lucerne, Dwalganup Subterranean Clover and *Phalaris tuberosa.*

8. Lucerne is the most important pasture plant in areas where ground water is relatively close to the surface.

9. The pasture plants most suitable to the areas receiving liberal or extended annual rainfall are Wimmera Rye Grass, Perennial Rye Grass, *Phalaris tuberosa,* Subterranean Clover, White Clover, and Strawberry Clover.

10. The main divisions of the higher rainfall areas are:—

1. Sandy and poor gravelly soils.
2. Red shotty ironstone soils.
3. Gray sticky loams.
4. Grey silty soils.
5. Old Subterranean clover lands.
6. Drained black land.
7. Moist dark flats or swamps.

A well balanced Perennial Rye Grass, Cocksfoot, and White Clover Pasture at Wood's Point

[From C.S.I.R., Bull 71, by A. E. V. Richardson, M.A., D.Sc., and H. P. C. Gallus, B.Sc.]

11. On poor sandy soils the cost of clearing is an important consideration. The area should be planted with Subterranean Clover and adequately manured with Superphosphate. When the fertility has been improved Wimmera Rye Grass may be introduced and in the course of time Perennial Rye Grass can be planted.

12. Subterranean Clover and Wimmera Rye Grass sown in conjunction with Superphosphate are the best pasture plants for shotty ironstone land.

13. Gray sticky loams are best suited to Subterranean Clover, Wimmera Rye Grass, Perennial Rye Grass, and *Phalaris tuberosa.*

14. When fully manured grey silts develop excellent pastures. After Subterranean Clover has been established and topdressed for a number of years, Wimmera Rye Grass, Perennial Rye Grass, or *Phalaris tuberosa* may be introduced.

15. Old Subterranean Clover land may be improved by the planting of Perennial Rye Grass or *Phalaris tuberosa.*

16. Subterranean Clover does not do well on much of the drained black land of the South-East. Strawberry Clover is ideally suited to these conditions, whilst White Clover thrives in the higher rainfall areas. Perennial Rye Grass is the best grass, whilst *Phalaris tuberosa* has given excellent results where it has been tried.

17. Dark moist flats yield the maximum amount of fodder when planted with Perennial Rye Grass and White Clover, but on raw peaty soils which are springy underfoot Yorkshire Fog should be substituted for the Rye Grass. On the other hand, for swampy soil, which is inclined to be brackish, Strawberry Clover is preferable to White Clover.

18. Good pasture management is required for best results. Most perennial pasture plants should only be lightly grazed in the first year. Annual plants such as Wimmera Rye Grass and Subterranean Clover respond to autumn cultivation, whilst all pastures should be tilled to assist growth and break up animal droppings. Adequate phosphatic manuring is necessary, whilst subdivision of fields and systematic grazing, together with the conservation of fodder allows for carrying the maximum number of stock. The manufacture of ensilage and meadow hay should be a regular practice.

19. Pasture improvement on the Irrigated Swamp lands is a special problem. The most useful pasture varieties for these areas are Prairie Grass, Perennial Rye Grass, Cocksfoot, *Phalaris tuberosa*, Kentucky Blue, Italian Rye Grass, White Clover, Montgomery Red Clover, Red Clover, and Lucerne.

20. A mixture of Perennial Rye Grass, Cocksfoot, White Clover, and Montgomery Red Clover; or *Phalaris tuberosa*, Kentucky Blue, White, and Montgomery Red Clover is recommended; whilst another useful mixture for a permanent pasture for the swamps contains Prairie Grass and White Clover.

21. The best temporary pasture for these conditions consists of Italian Rye Grass and Red Clover

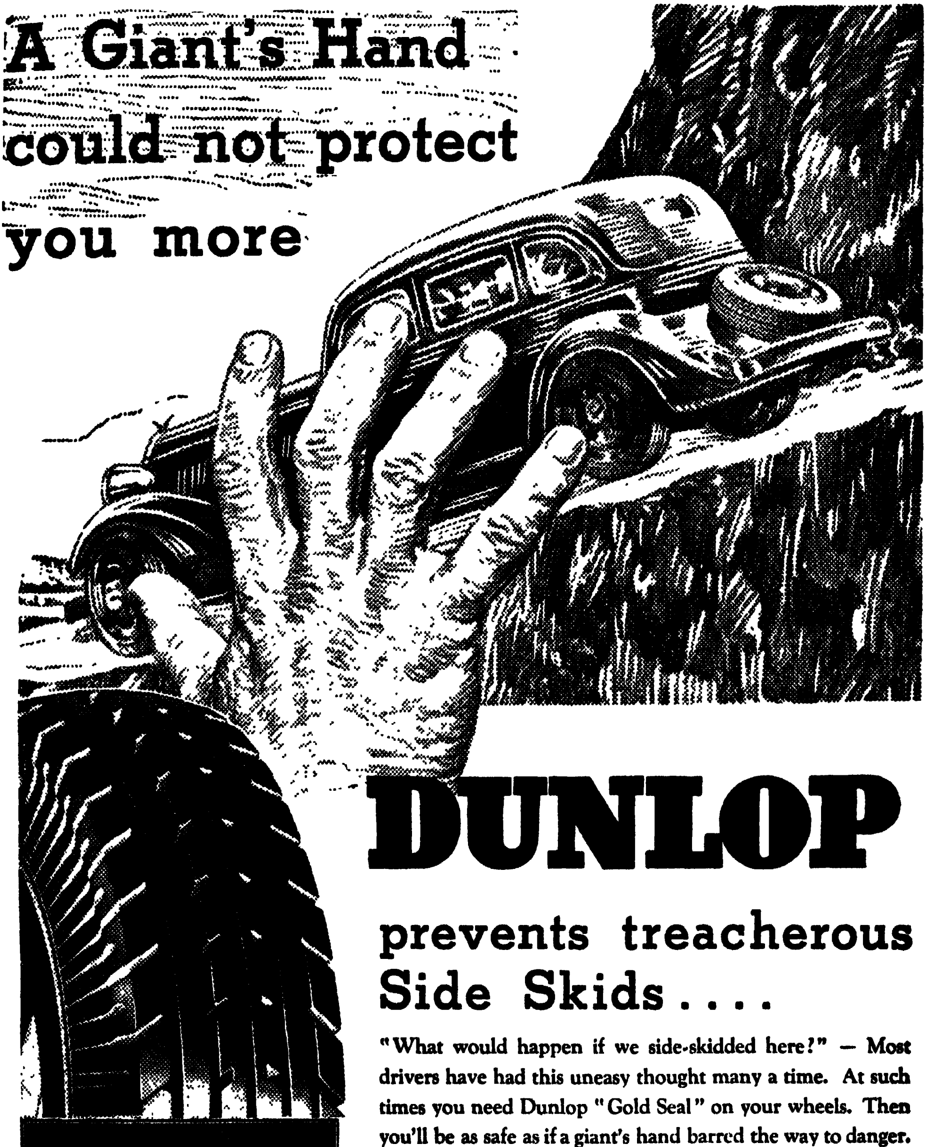
22. For mowing and high production during the summer months the planting of lucerne is recommended.

23. For successful utilisation of the pasture growth subdivision and regular grazing coupled with the manufacture of ensilage and meadow hay are essential. Annual manuring, the use of pasture harrows and ability to irrigate at frequent intervals are also factors affecting pasture production on the reclaimed areas of the Lower Murray.

WORMS IN SHEEP.

BLACK LEAF 40.

Replying to a correspondent at Tintinara, who asked for the correct dose of Black Leaf 40 and bluestone solution for internal parasites of sheep, Mr. R. H. F. Macindoe, B.V.Sc., M.R.C.V.S., says the solution recommended is as follows:—Bluestone (copper sulphate), 1lb.; water, 6galls.; Black Leaf 40, 13½ fluid ounces. *To make*—Dissolve the bluestone crystals in hot water and add the balance of water to make 6galls. of solution. Then stir in the Black Leaf 40. *Doseage Table*: Adult sheep, 2 fluid ounces; 2-tooth sheep, 1½ fluid ounces; lambs, 6-12 months, 1 fluid ounce; lambs, 3-6 months, ½ fluid ounce. Sheep are drenched without any preliminary fasting and can be turned out to graze immediately after. It will be noticed that after drenching, the sheep may stagger for an hour or two, but they soon recover. No mortality or other ill-effects have been noted or reported following the use of this drench, but it is essential that the doseage recommended be carefully followed.



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RAISING EXPORT LAMBS ON SUBTERRANEAN CLOVER PASTURE LANDS.

[By L. J. Cook, R.D.A., Manager Kybybolite Experimental Farm.]

During 1933 and 1934 a small experiment on the raising of Export Fat Lambs has been conducted at the Kybybolite Experimental Farm. The idea was primarily to compare the development of various crosses, when grazed on improved Subterranean Clover pastures, but the scope of the work has been restricted by the funds and labour available. No attempt could be made to test the various breeds or cross-breeds of ewes, as mothers, but a trial of five of the more important British breeds of rams, used on Comeback ewes is being carried out.

The Farm has for some seasons been breeding a good quality line of Comeback ewes, the result of mating Merino rams back to half-bred English Leicester x Merino ewes, and a selected line of these is being used as mothers for the lambs. Four flocks in 1933 and five in 1934 were carefully selected, even in type, development, age, and live weight.

In 1933 each flock consisted of 17 four-tooth and 29 six and eight tooth ewes, and the average live weight at mating time was 116lbs.

In 1934 each flock consisted of 13 six-tooth and 31 eight-tooth ewes, and the average live weight at mating was 115lbs.

The four sires used in 1933 were Suffolk, Dorset Horn, Southdown, and English Leicester, and in 1934 a Ryeland was added for the fifth flock.

Whilst being mated the flocks were grazed in fields of approximately equal area, and containing similar pasturage, but after mating, all the ewes were run together as one flock, and grazed under a rotational system on good fertilized clover pastures. A week or so before lambing commenced the flock was again divided into its sections, and each run on similar type of clover pasture during the lambing period. After marking, lambs and ewes were again run together as one flock. During the whole period neither ewes nor lambs were handfed, and they existed and grew entirely on grazing.

With the exception of the second consignment in 1933, all lambs were sold off their mothers, and were grazed only on Subterranean Clover with its mixture of naturalised grasses, such as Barley and Brome Grasses. On account of unfortunate attacks by stray dogs, the late lambs in 1933 received a setback, and had to be weaned, and were topped on a pea stubble before being sold on 1st February, 1934.

The flocks were examined twice daily during lambing, and note of births taken.

In 1933 three ewes were given assistance, one each in lamb to the Suffolk, Southdown, and Dorset Horn. Two ewes died at lambing, one in lamb to Suffolk and one in lamb to English Leicester.

In 1934 three ewes were given assistance, two in lamb to Suffolk and one in lamb to Ryeland, and no ewes were lost at lambing.

The following table shows the number of lambs born, died, marked, and marketed from each of the flocks each season.

Ewes were mated to rams on 18th February, 1933, and 5th February, 1934, and lambs commenced to arrive on 15th July, 1933, and 1st July, 1934

TABLE I.—*Lambing Results.*

Season.	Ewes Mated.	Ewes Failed to Breed.	Ewes Died.	Total Lambs Born.		Lambs Born Dead.	Lambs Died between Birth and Marking.	Lambs Marked.			Lambs Died between Marking and Marketing.	Lambs Marketed.	
		No.	No.	No.	%	No.	No.	No.	%		No.	No.	%
1933	46 Comeback x Southdown	1	0	61	137·7	6	5	50	111·1	114·5	3	47	110·0
1934	44 Comeback x Southdown	20	0	34		0	5	29	120·8		0	29	
1933	46 Comeback x Dorset Horn	2	0	65	141·0	8	7	50	113·6	119·3	5	45	109·6
1934	44 Comeback x Dorset Horn	5	0	52		1	2	49	125·6		3	46	
1933	46 Comeback x Suffolk	3	1	55	137 3	2	2	51	118 6	120·5	7	44	107·2
1934	44 Comeback x Suffolk	4	0	59		3	7	49	122 5		4	45	
1933	46 Comeback x English Leicester	2	1	64	138 5	3	7	54	122 7	112 0	3	51	107·2
1934	44 Comeback x English Leicester	5	1	51		1	11	39	100 0		1	38	
1934	44 Comeback x Ryeland	11	0	47	142·4	2	4	41	124·2		2	39	118·2
Totals—													
1933	184 Comeback ewes	8	2	245		19	21	205	116 5		18	187	106·2
1934	220 Comeback ewes	45	1	243		7	29	207	118·3		10	197	112·6
Both years	404 Comeback ewes	53	3	488		26	50	412	117 4		28	384	109 4

Percentages quoted in above table show per cent. of lambs to the number of ewes that bred.

It will be noticed that in the first column of Table I. quite a large number of ewes mated to the Southdown and Ryeland rams in 1934 failed to breed. This is attributed solely to the partial failure of the individual rams used, and allowance must necessarily be made in cases such as these. We were forced to restrict the flocks in size, and could only use one ram in each, which is not altogether a practical procedure in sheep breeding. Hence, in perusing the table, due allowance must be made for the dry ewes.

Column 3 shows that in 1933 the Dorset Horn and English Leicester crosses were approximately equal in prolificacy with 65 and 64 lambs born respectively, closely followed by the Southdown cross with 61 births. In 1934 the Suffolk cross produced the most lambs with 59 births. For the two seasons the percentage of births to ewes in lamb show the Ryeland cross (one season only) greatest with 142.4 per cent.; the Dorset Horn cross second with 141 per cent.; the English Leicester cross third with 138.5 per cent,; and the Southdown and Suffolk crosses produced 137 per cent., so that from this aspect there was very little difference in prolificacy shown by the different crosses.

Column 4 shows the number of lambs born dead, the Dorset Horn cross with 9 having the greatest number, although again no significant difference amongst the breeds is noted.

Column 5 shows the number of lambs that died between birth and marking and consisted mostly of lambs that died during the first few days after lambing. The English Leicester cross with 18 shows double the loss of the other crosses.

Column 6 gives the actual number of lambs marked each year, and the percentage marked to ewes that bred for the two seasons. In 1934 the Dorset Horn cross had the highest percentage with 125.6 per cent., closely followed by the Ryeland cross with 124.2 per cent. For the two seasons combined, the Suffolk cross marked the most with 120.5 per cent., with the Dorset Horn cross close up with 119.3 per cent. This result shows the strength of the Suffolk cross lambs, for whereas this cross had the least number of births, they had less losses until marking, enabling them to mark the highest percentage. These lambs were noticed to be very strong and vigorous. The weakest lambs were amongst the English Leicester cross, which reduced their percentage marked to 112 per cent.

The next column shows the number of lambs that died between marking and marketing, and two facts are to be noted. Firstly, that considerably less lambs were lost during this stage in 1934 than in 1933; and secondly, that the bulk of deaths occurred amongst the stronger and more vigorous lambs. These deaths can largely be attributed to attacks by the *Bacillus ovitoxicus*, causing the braxy-like disease entero-toxaemia. The strong lambs of the Suffolk and Dorset Horn crosses suffered most during this period.

The final column gives the actual number of lambs marketed, and the percentages to ewes that bred. Here, again, with the exception of the Ryeland cross, which has had only the one year of test, there is not much difference between the crosses, less than 3 per cent. between the English Leicester and Suffolk crosses with 107.2 per cent., and the Southdown cross with 110 per cent.

For the two seasons 384 lambs (109.4 per cent.) were marketed from 351 ewes that bred.

All lambs reared were marketed, and in two consignments each season. In 1933 the tops were consigned to freezers on 7th November (13 to 14 weeks of age), and the balance on 1st February, 1934. The 1934 tops were consigned on 30th October (14 to 15 weeks of age), and the balance on 18th December (21 to 22 weeks of age).

WEIGHT OF LAMBS.

The lambs were weighed individually on the Farm before consignment, and the cold dressed weights have been provided by the Portland Freezing Works.

Table II. shows the average live and dressed weights of each cross in the four consignments, with the percentages of dressed to live weight.

It is significant that in every consignment the Comeback x Southdown lambs averaged the greatest percentage of dressed weight. They were 2 per cent. and 3 per cent. better than the other crosses. This is typical of the breed and verifies similar results obtained by experimentalists in previous work in other districts, where Southdown blood has been used. By averaging the four consignments it is shown that the Southdown cross lambs dressed 43.1 per cent. of their live weight, the Dorset Horn cross 41.9, the Suffolk cross 41.3 per cent., the Ryeland cross 40.3 per cent., and the English Leicester 40.2 per cent. The general average of 41.4 per cent. dressed to live weight of all lambs is perhaps low, but allowance must be made for 150 miles transit from Farm to Freezing works. The lambs were all sold in the wool.

TABLE II.—*Weight of Lambs.*

Season.		Breed.	Live Weight at the Farm.		Dressed Weight at Portland.			
			Lbs.		Lbs.		Per cent.	
1933....	28	Comeback x Southdown	72·8	71·9	31·7	31	43·5	43·1
	17	Comeback x Southdown	75·3		32·2		42·7	
1934....	8	Comeback x Southdown	66·6		31·5		47·3	
	19	Comeback x Southdown	69·8		28·5		40·8	
1933....	29	Comeback x Dorset Horn	75·3	76·6	30·7	32·1	40·9	41·9
	13	Comeback x Dorset Horn	90·2		37·1		41·1	
1934....	33	Comeback x Dorset Horn	73·1		32·8		44·8	
	11	Comeback x Dorset Horn	74·5		27·4		36·8	
1933....	33	Comeback x Suffolk	75·1	75·6	30·7	31·2	40·9	41·3
	9	Comeback x Suffolk	81·9		33·2		40·6	
1934....	26	Comeback x Suffolk	73·0		33·1		45·3	
	17	Comeback x Suffolk	77·4		28·0		36·2	
1933....	26	Comeback x English Leicester	70·5	75·7	28·5	30·4	40·4	40·2
	22	Comeback x English Leceister	83·5		32·9		39·5	
1934....	16	Comeback x English Leicester	68·4		30·9		45·1	
	21	Comeback x English Leicester	79·7		29·8		37·4	
1934....	18	Comeback x Ryeland	70·5	72·5	31·9	29·2	45·2	40·3
	19	Comeback x Ryeland	74·3		26·6		35·8	
Average all crosses—								
1933....	116	First consignment	73·5	74·8	30·5	31·0	41·4	41·4
	61	Second consignment	82·4		33·7		40·9	
1934....	101	First consignment	71·3		32·3		45·3	
	87	Second consignment	75·2		28·2		37·5	

The whole 365 lambs averaged approximately 75lbs. live weight when removed from their mothers and dressed 31lbs. on the hooks, an ideal weight for export purposes. The Dorset Horn cross were the heaviest lambs, 76½lbs. on the average, and dressed 32.1lbs. The Suffolk and English Leicester crosses were 1lb. lighter in live weight and dressed 31.2 and 30.4lbs. respectively. The Southdown cross were the lightest lambs, 72lbs. live weight, but dressed the best with 31lbs. average.

QUALITY OF LAMBS.

Regarding the quality of the lambs for export, the following table shows the number and percentages of carcasses of each cross in each consignment, placed in grades by the purchasers (Messrs. Borthwicks Limited).

TABLE III.—*Quality of Lambs.*

Season.	Breed.	First Quality.	Second Quality.	Third Quality.	Rejects.
		No.	No.	No.	No.
1933 .. 28	Comeback x Southdown .	28	—	—	—
17	Comeback x Southdown .	14	2	—	1
1934 .. 8	Comeback x Southdown .	8	—	—	—
19	Comeback x Southdown .	14	5	—	—
72		64 88·9%	7 9·7%	—	1 1·4%
1933 .. 29	Comeback x Dorset Horn	18	11	—	—
13	Comeback x Dorset Horn	10	3	—	—
1934 .. 33	Comeback x Dorset Horn	29	4	—	—
11	Comeback x Dorset Horn	4	5	2	—
86		61 70·9%	23 26·8%	2 2·3%	—
1933 .. 33	Comeback x Suffolk	18	13	2	—
9	Comeback x Suffolk	3	4	1	1
1934 .. 26	Comeback x Suffolk	20	6	—	—
17	Comeback x Suffolk	5	9	3	—
85		46 54·1%	32 37·6%	6 7·1%	1 1·2%
1933 .. 26	Comeback x English Leicester	12	10	2	2
22	Comeback x English Leicester	18	4	—	—
1934 .. 16	Comeback x English Leicester	11	4	1	—
21	Comeback x English Leicester	9	12	—	—
85		50 58·8%	30 35·3%	3 3·5%	2 2·4%
1934 .. 18	Comeback x Ryeland ...	16	2	—	—
19	Comeback x Ryeland ...	6	8	5	—
37		22 59·5%	10 27·0%	5 13·5%	—
	Total all crosses, 365 lambs	243 66·6%	102 27·9%	16 4·4%	4 1·1%

This table shows that of the 365 lambs, 243 were classed as first quality, 102 as second quality, 16 as third quality, and 4 were rejected. This result is quite satisfactory when it is remembered that every lamb reared in the flocks was sent to the freezers—none were held back on the Farm.

The outstanding fact is the excellent quality of lambs produced by the Southdown cross. In the first consignment of each season this cross was 100 per cent. first quality, and the results of the second consignments show that they maintain their primeness very well. In all 64 lambs out of 72 (89 per cent.) of this cross were first quality, whereas the average of all crosses was only 66.6 per cent. first quality. These Southdown cross lambs produced very fine shapely carcasses of prime quality and comparatively even in weight. In live weight this season there was a variation of 26lbs. between the lightest and heaviest lambs, but 55 per cent. of the lambs weighed within 3lbs. of the average for all of the cross.

The Comeback x Dorset Horn lambs ranked second in quality with 71 per cent. first quality, 27 per cent. second, and only 2 per cent. third quality. They were a fine prime lot, growing and maturing quickly, but lacking in conformation. Also there was a greater variation in the live weights, only 36 per cent. of the lambs this season weighing within 3lbs. of the average for the cross and there was a difference of 37lbs. between the lightest and heaviest lambs.

The Comeback x Ryeland lambs produced 59½ per cent. first quality, 27 per cent. second quality, and 13½ per cent. third quality. The tops of this cross were very fine prime lambs, almost equal to the Comeback x Southdown. Unfortunately there was a fairly large number of late lambs in this group and they caused the high percentage of third grade lambs, which we were forced to market in an immature state. The weights of these lambs varied much the same as the Comeback x Dorset Horn, there being 32lbs. difference between the lightest and heaviest lambs and only 35 per cent. of the lambs weighed within 3lbs. of the average for the cross.

For shape and conformation the Comeback x English Leicester lambs were good and were not greatly inferior to the Southdown cross. They were, however, slower in maturing, and did not thrive quite so well as the other crosses. Fifty-nine per cent. of their carcasses were classed as first quality, and in evenness of weight and development they ranked next to the Southdown cross, 46 per cent. of their lambs weighing within 3lbs. of the average for the cross.

The Suffolk cross lambs show to least advantage as regards quality. They were very strong, quick-growing lambs, but did not maintain their primeness well. The carcasses lacked in conformation more than the Dorset Horn cross. They also showed the greatest variation in development, as only 30 per cent. of the lambs weighed within 3lbs. of their average live weight.

VALUE OF THE LAMBS.

The lambs this season were all sold on the hooks at Portland, and Table IV. gives the details of returns for the various crosses:—

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TABLE IV.—*Lamb Values and Returns, 1934.*

No. and Breed.	Lamb. lbs. Price.	Value.	Value per Carcass.		Skin Value.	Charges.	Net Value of Lamb.	
	d.	£ *s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
Comeback x Southdown—								
1st Consignment—								
8 carcasses	252 at 6⅛	6 8 7	16 1		2 0	2 1	16 0	14 10
2nd Consignment—								
14 carcasses	401 at 6⅛	10 4 8	14 7½	14 0	2 4	2 0	14 4	
5 carcasses	141 at 5¼	3 1 8	12 4					
Comeback x Dorset Horn								
1st Consignment—								
22 carcasses	699 at 6⅛	17 16 9	16 2½	16 3	2 2	2 1	16 4	15 5½
6 carcasses	231 at 5 13/16	5 11 11	18 8					
1 carcass	43 at 5⅝	1 0 2	20 2					
4 carcasses	108 at 5¼	2 7 3	11 10					
2nd Consignment—								
4 carcasses	126 at 6⅛	3 4 4	16 1	12 8½	2 2	2 0	12 10½	
5 carcasses	129 at 5¼	2 16 5	11 3					
2 carcasses	46 at 5	0 19 2	9 7					
Comeback x Suffolk—								
1st Consignment—								
13 carcasses	429 at 6⅛	10 19 0	16 10	16 2	2 3	2 1	16 4	14 11
7 carcasses	266 at 5 13/16	6 8 10	18 5					
6 carcasses	165 at 5¼	3 12 2	12 0					
2nd Consignment—								
5 carcasses	150 at 6⅛	3 16 7	15 4	12 9½	2 0	2 0	12 9½	
9 carcasses	251 at 5¼	5 9 10	12 2½					
3 carcasses	75 at 5	1 11 3	10 5					
Comeback x English Leicester—								
1st Consignment—								
10 carcasses	316 at 6⅛	8 1 4	16 1½	15 0½	2 3	2 1	15 2½	14 8½
1 carcass	38 at 5 13/16	0 18 5	18 5					
4 carcasses	114 at 5¼	2 9 10	12 5½					
1 carcass	26 at 5	0 10 10	10 10					
2nd Consignment—								
9 carcasses	288 at 6⅛	7 7 0	16 4	14 0½	2 4	2 0	14 4½	
12 carcasses	338 at 5¼	7 7 11	12 4					
Comeback x Ryeland—								
1st Consignment—								
15 carcasses	480 at 6⅛	12 5 0	16 4	16 0	2 4	2 1	16 3	14 3
1 carcass	37 at 5 13/16	0 17 11	17 11					
2 carcasses	57 at 5¼	1 4 11	12 5½					
2nd Consignment—								
6 carcasses	185 at 6⅛	4 14 5	15 9	12 3	2 1	2 0	12 4	
8 carcasses	219 at 5¼	4 15 10	12 0					
5 carcasses	102 at 5	2 2 6	8 6					
Total all crosses—								
1st Consignment—								
68 carcasses	2,176 at 6⅛	55 10 8	16 4	15 11½	2 2½	2 1	16 1	14 10½
15 carcasses	572 at 5 13/16	13 17 1	18 5½					
1 carcass	43 at 5⅝	1 0 2	20 2					
16 carcasses	444 at 5¼	9 14 2	12 1½					
1 carcass	26 at 5	0 10 10	10 10					
2nd Consignment—								
38 carcasses	1,150 at 6⅛	29 7 0	15 5½	13 3	2 2	2 0	13 5	
39 carcasses	1,078 at 5¼	23 11 8	12 1					
10 carcasses	223 at 5	4 12 11	9 3½					

The prices in the final column show the net price per head for each cross received at Kybybolite, after paying freight and charges, and shows that the Comeback x Dorset Horn lambs returned the best price, namely, 15s. 5½d. per head—6½d. better than the Suffolk cross, which realised 14s. 11d. each, and 7½d. better than the Southdown cross, which realised 14s. 10d. each.

The English Leicester cross averaged 14s. 8½d. and the Ryeland cross 14s. 3d. each. On perusing the returns of the first consignment it will be noticed that only 1d. per lamb separated the Dorset Horn, Suffolk, and Ryeland crosses, whilst the Southdown cross with 16s. per lamb was only 3d. less. In the second consignment the Southdown and English Leicester crosses realised 14s. 4d. each—1s. 6d. and 2s. per head better than the others.

The skin value of the different crosses did not vary much, the English Leicester cross being worth 1d. per skin more than the Ryeland cross, the latter ½d. per skin more than the Southdown and Dorset Horn crosses, and 1d. more than the Suffolk cross.

The charges on conveyance and selling of lambs at Portland are approximately 2s. per head, including 7d. railage Kybybolite to Mount Gambier and 6d. railage Mount Gambier to Portland.

In the next table the prices received in 1933 have been included with those of 1934, and the average price of each quality lamb has been computed for the two seasons. Details of the sale of 1933 lambs were published in Vol. 37, pages 1238-1240, *South Australian Journal of Agriculture.*

Table V.—*Value of Lambs at Kybybolite*, 1933-34.

No.	Quality.	Breed.	Price per lamb.			
			s.	*d.*	*s.*	*d.*
64	First ...	Comeback x Southdown	15	10	15	5½
7	Second .	Comeback x Southdown	13	2		
1	Reject .	Comeback x Southdown	7	9		
61	First ...	Comeback x Dorset Horn	16	10	15	7
23	Second .	Comeback x Dorset Horn	12	8½		
2	Third ..	Comeback x Dorset Horn	9	9		
46	First ...	Comeback x Suffolk	16	4¾	14	7
32	Second .	Comeback x Suffolk	12	11¾		
6	Third ..	Comeback x Suffolk	10	5½		
1	Reject .	Comeback x Suffolk	8	11¾		
50	First ...	Comeback x English Leicester	16	10	14	8¾
30	Second .	Comeback x English Leicester	12	4		
3	Third ..	Comeback x English Leicester	9	10¼		
2	Rejects .	Comeback x English Leicester	5	5¼		
22	First ...	Comeback x Ryeland	16	5½	14	3
10	Second .	Comeback x Ryeland	12	2½		
5	Third ..	Comeback x Ryeland	8	7		
Average value of all lambs, 1933			15	1½		
Average value of all lambs, 1934			14	10½		
Mean average value of all lambs 1933-34			15	0		

These figures show that the whole of the lambs sent to the freezers realised 15s. 1½d. per head at Kybybolite in 1933 and 14s. 10½d. in 1934, or a mean average of 15s. per head for the two seasons. The Dorset Horn cross was the most valuable at 15s. 7d. each, whilst the Southdown cross averaged 15s. 5½d.—only 1½d. each less. The English Leicester cross averaged 14s. 3¾d.—*i.e.*, 10¼d. each less than the Dorset Horn cross, and the Suffolk cross realised 14s. 7d.—1s. less each.

RETURN OF LAMB VALUE PER EWE THAT BRED.

The next table compares the return per ewe from each flock, and to obviate the effect of single ram mating, the dry ewes have not been counted.

TABLE VI.

	Value per Ewe. s.	d.
69 Comeback ewes mated to Southdown ram produced 76 marketed lambs	17	0¼
83 Comeback ewes mated to Dorset Horn ram produced 91 marketed lambs	17	1
83 Comeback ewes mated to Suffolk ram produced 89 marketed lambs	15	7¾
82 Comeback ewes mated to English Leicester ram produced 89 marketed lambs	15	11¾
33 Comeback ewes mated to Ryeland ram produced 39 marketed lambs	16	10

This table shows that ewes mated to Dorset Horn ram have returned 17s. 1d. each—only ¾d. more than the ewes mated to the Southdown ram. Those mated to the Ryeland ram returned 16s. 10d., or 3d. less, whilst those mated to English Leicester and Suffolk rams returned considerably less, namely, 1s. 1¼d. and 1s. 5¼d. per ewe respectively.

These figures, however, do not take into account the question of early or late maturity of lambs, and as this varied with the different breeds, an allowance for grazing can be deducted, which would then give a better comparative value.

RETURN PER EWE LESS LAMB GRAZING COST.

Table VII. shows deductions from the returns from each cross, allowing grazing of lambs at 2d. per week per head.

TABLE VII.

Comeback x Southdown returned 17s. 0¼d. per ewe
less 30 lambs for 12 weeks at 2s. each
" 17 lambs for 24 weeks at 4s. each
" 10 lambs for 13 weeks at 2s. 2d. each } 2s. 9½d. equals 14s. 2¾d. per ewe.
" 19 lambs for 20 weeks at 3s. 4d. each
Comeback x Dorset Horn returned 17s. 1d. per ewe
less 32 lambs for 12 weeks at 2s. each
" 13 lambs for 24 weeks at 4s. each
" 35 lambs for 13 weeks at 2s. 2d. each } 2s. 6d. equals 14s. 7d. per ewe.
" 11 lambs for 20 weeks at 3s. 4d. each
Comeback x Suffolk returned 15s. 7¾d. per ewe
less 35 lambs for 12 weeks at 2s. each
" 9 lambs for 24 weeks at 4s. each
" 28 lambs for 13 weeks at 2s. 2d. each } 2s. 6d. equals 13s. 1¾d. per ewe.
" 17 lambs for 20 weeks at 3s. 4d. each
Comeback x English Leicester returned 15s. 11¾d. per ewe
less 29 lambs for 12 weeks at 2s. each
" 22 lambs for 24 weeks at 4s. each
" 17 lambs for 13 weeks at 2s. 2d. each } 2s. 10d. equals 13s. 1¾d. per ewe.
" 21 lambs for 20 weeks at 3s. 4d. each
Comeback x Ryeland returned 16s. 10d. per ewe
less 20 lambs for 13 weeks at 2s. 2d. each } 2s. 8¾d. equals 14s. 1¼d. per ewe.
" 19 lambs for 20 weeks at 3s. 4d. each

With these allowances made, we find that the ewes mated to the Dorset Horn ram show an increased return of 4¼d. per head over those mated to the Southdown ram, and the latter have only 1½d. per head increase over those mated to the Ryeland ram. The return from ewes mated to the Suffolk ram is also improved, and equals that from ewes mated to the English Leicester ram, both being 1s. 5¼d. less than return from ewes mated to the Dorset Horn ram.

In conclusion, the experiment shows that the raising of Fat Lambs on the improved pastures during the two seasons has been quite satisfactory.

In handling Fat Lamb flocks on these lands it is imperative to graze them on well fertilised pasture. The fields used for this experiment have received 1cwt. 45 per cent. superphosphate per acre annually for the last six or eight years, and during the two seasons under review have carried 2.98 sheep per acre per annum, which includes 2.28 sheep allowance for ewes, and 0.70 sheep allowance for the time on which lambs were grazing.

Rotate the grazing of fields, and drop the lambs sufficiently early to enable them to be marketed before the grass seeds become troublesome.

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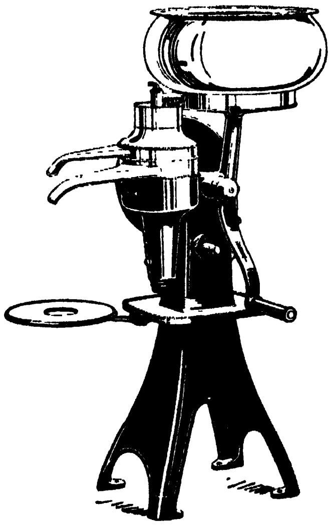

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THE STATE EXPERIMENT ORCHARD, COROMANDEL VALLEY, NEAR BLACKWOOD, SOUTH AUSTRALIA.

[By GEO. QUINN, Chief Horticultural Instructor.]

(*Continued from page* 1539.)

ROOTSTOCKS IN RELATION TO THE OCCURRENCE OF BITTER PIT IN APPLES.

The Problem of Bitter Pit.

In a short introductory statement on "the Prevention of Bitter Pit," contributed to "an Annotated Bibliography on Bitter Pit" issued by the Imperial Bureau of Fruit Production last year (1934), Dr. Barker, principal investigator at the Low Temperature Research Station, Cambridge, in outlying the results of the world-wide work covered in the publication, made the following comment:—"In spite of the numerous investigations on the disease which have been carried out in different parts of the world, bitter pit remains a major source of wastage in certain varieties of apple, and critical information as to the causal factors is still lacking. Indeed, it is not even known whether the injury to the cells which eventually results in their death and browning actually occurs while the apple is still on the tree or whether it may also occur after the fruit is picked."

Dr. Barker briefly referred to the research work conducted during recent years by Carne and others in Australia, having for its object the lessening of the wastage occurring amongst apples exported from the Commonwealth. It has been claimed by these investigators that by harvesting the fruit when it has arrived at a certain stage of maturity the further development of the disease in the apples during overseas transport or in land storage will be largely averted. As Dr. Barker remarked, to bring this procedure to practical demonstration on a commercial basis some simple and reliable method of determining when the desired stage of maturity has arrived must be evolved and the apple growers educated to the use of same. The present writer has endeavoured to induce the apple growers of this State to utilise the starch staining method recommended by Carne and his co-workers, but found its practical application to even a limited range of export varieties resulted in discrepancies being revealed which not only confused the growers but unfortunately aroused suspicion in their minds as to its reliability in respect to any of the kinds usually exported. The use of a colour chart has been received with greater confidence by the practical apple growers, but this may be due to the fact that certain colour changes in the ground colour of the skin of the apple, as well as of other fruits, has long been observed by them to take place at the approach of maturity in the fruit.

Whilst the establishment of the above objective on a reliable working basis is a most laudable and desirable subject for research, and its early achievement highly important to the welfare of the apple growing industry in this and many other countries, it cannot avert those extensive preliminary losses which arise in the orchard from the destruction and wastage caused by this disease in one of its forms before the apples have reached either maturity or the packing shed. The data produced in this report on the trials conducted at the Blackwood State Orchard from 1908 to 1934 will, it is hoped, go some way towards showing the true extent of this wastage over a lengthy period of years in so far as certain varieties grown for export in this State may be concerned.

Dr. Barker's review shows that the results of observations made by many investigators into certain characteristics of Bitter Pit indicate that they closely coincide in all countries. These observations chiefly consist of recording its increased occurrence with the increased size of the individual apples, which is usually found in years of light yields and particularly from young or vigorous trees. "For the investigator seeking to prevent Bitter Pit there is then," writes Dr. Barker, "the choice of experimental work along many lines, and we may usefully consider which lines appear to give most promise of success." As judged by the possibility of quick results there seemed to Dr. Barker little doubt that "investigations of the effects of the following factors, viz., maturity at picking, position of fruit on tree, size of crop, type of pruning, and effect of blossom or fruit thinning are particularly likely to bring success." He further adds, "Any results obtained in these investigations should be readily applicable commercially since, unlike climate and soil conditions the above factors are all readily controlled by the grower. In order to ascertain the influence of rootstocks, soil conditions, rainfall, &c., comprehensive orchard and storage investigations are required." "Hitherto," he states, "little attention appears to have been given to the question of the variation in susceptibility of different trees to Bitter Pit." "So far as we are aware," he writes, "it is not known to what extent apparently similar trees growing adjacent to one another may differ in susceptibility, nor whether trees which are susceptible in one season are also highly susceptible in another." It may be a singular coincidence only, but with the exception of cold storage trials some data on practically each of these lines have been annually collected from plots of trees growing in the State Orchard at Blackwood extending in some instances for upwards of two decades.

It is doubtful, however, that with the exception of the figures tabulated in this present article which deals with certain rootstocks and combinations of same, whether this carefully detailed data ever will be presented for the information of those who are studying or suffering losses from this disease here and abroad.

The "Annotated Bibliography on Bitter Pit," which has been quoted, contains a brief outline of the writings on this disease of no less than 123 authors and observers located in 10 different countries. Amongst these the names of well known scientific and technical writers freely appear from Great Britain, United States of America, Australasia, South Africa, and Germany, and to a lesser extent from Canada, France, Russia, and Bulgaria showing, as they do, that the seriousness of the disease is practically world-wide.

The first authenticated reference to it appeared in 1869 when a German writer, Jaegar, published an account of his observations of the so-called "Stippen" disease in the *Illus. Monatshefte fur Obst und Weinbau.* It should interest South Australian fruitgrowers to know that it was an amateur investigator of plant diseases and fruit pests in this State who shortly afterwards described its presence in apples from South Australian orchards.

In 1886, Frazer S. Crawford, Government Photolithographer by profession, but ardent student of economic biology by choice or hobby, published by the direction of his Ministerial head (Commissioner of Crown

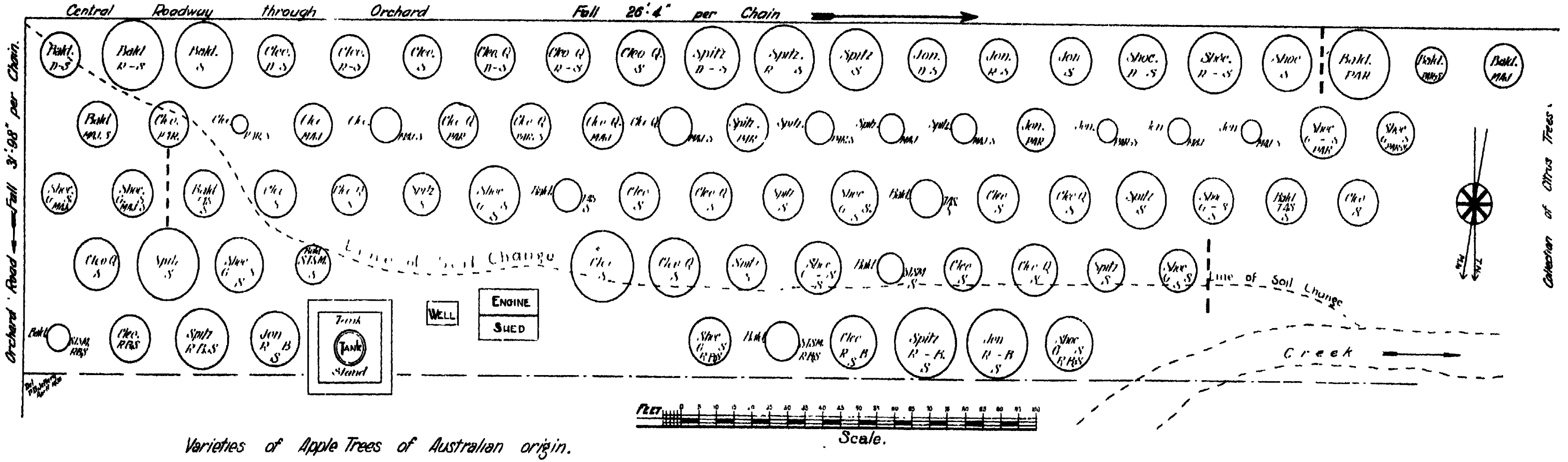
Lands) a booklet containing the results of his studies of the injuries arising in local orchards from the Fusicladiums (Black Spot or Scab) of apples and pears, codlin moth, the latter then only recently introduced, and several other more minor pests affecting the fruitgrowers' crops. Amongst these latter, on page 53, under the heading of "Spotted Apples," Crawford wrote, "For several years I have received apples from various parts of the colony covered with slightly depressed roundish spots or pits about ⅛in. in diameter. In most cases the colour of the spots was normal, but in one case the spots were brown. Beneath the pits the flesh was coloured brown for some distance towards the core, but gradually lessening in width until the altered part disappeared. This part, although decayed in one sense, did not cause adjacent parts to rot as in ordinary vegetable decay. Although it seems natural to suppose that the diseased spots are of fungus origin, yet I could not detect with the microscope any mycelium permeating the tissues." Although his was the first recorded reference to this disease in Australia, Crawford relates that "one grower asserted that the disease appeared owing to the trees being young and making too much sap when planted in a damp situation." The late Hon. Thomas Playford, who was an apple-grower, also informed Crawford he had seen this disease in apples as early as in 1860 in the Mount Lofty Ranges near Adelaide.

In the light of subsequent investigations the assertion of the first grower quoted, although somewhat crudely stated, has proved to be practically correct as to one of the principal predisposing factors which the world over has been stated to have operated whenever the Bitter Pit appeared in apples. Crawford's description of the disease is also sufficiently accurate to identify his "spotted" or "pitted" apples with what is now known as Bitter Pit. The context of his article indicates that his description was drawn chiefly from apples which had been stored away in a seemingly sound condition. He further stated that certain varieties were deemed more susceptible than others, particularly if taken from a small (short) crop, when the individual apples were large. He records that growers asserted that "even in normal crops the large fruits often developed the disease whilst the smaller ones rarely did so." In fact, notwithstanding all that has been placed on record relative to the circumstances surrounding the occurrence of this disease since 1886 Crawford's statements and observations stand undisproved and may be accepted as an outline of present-day knowledge on that phase of the subject.

In 1891 L. R. Jones, in the fifth report of the Vermont Agricultural Experimental Station, U.S.A., described the disease for the first time in America and called it "Fruit Spot," but later "Baldwin Spot," owing to having observed the peculiarly great susceptibility of the fruit of the favourite American variety of that name to suffer wastage from the defect.

A year later (1892) Dr. N. A. Cobb, Plant Pathologist to the Department of Agriculture of New South Wales, referred to a "mysterious disease" in New South Wales apples which transpired to be a closely related form of the defect which is now called "Blotchy Cork" by recent investigators in the United States of America and Australia. In 1895 Cobb again mentioned the disease in the *Agricultural Gazette* of New South Wales and referred to it as "Bitter Pit" owing to a bitterness which was always detectable in the brown dead cells of the tissue lying beneath the epidermis of the apple. Cobb, however, in the absence of any evidence of a causal organism in the "pits," surmised that these forms of disease arose from the punctures previously

Sketch Plan "*Bitter Pit*" Rootstock Trial Plot—showing mean spread of each tree.



Varieties of Apple Trees of Australian origin.

inflicted on the immature apples by insects and consequently proposed that the term "stigmanose" be applied to the diseased condition found in these "pits" or "spots."

In the January issue of the *South Australian Journal of Agriculture*, 1905, pages 305-309, the present writer outlined the local position relative to the occurrence of this disease and made suggestions for the avoidance of certain cultural treatments which it was claimed had predisposing influences wherever the defect was most frequently found. A list of varieties most commonly grown in the orchards of the State was presented in tabulated form in the order of their respective suspected degrees of susceptibility to the occurrence of Bitter Pit in the fruits. Lines of orchard research such as the selection of rootstocks and scions from varieties or trees deemed to bear fruits which were either immune or highly resistant to the disease, were advocated.

In so far as the apple-growing industry of Australia was concerned, it was during these early years of the present century that attention was most persistently drawn to the losses arising from this disease in the orchard as well as in the exported and locally stored apples. In fact, it may be claimed that the tide of complaints from overseas markets continued to rise in an increased ratio to the then appreciable advances being made in the quantities shipped abroad. In the States of New South Wales and Victoria where the Departments of Agriculture each employed a Plant Pathologist, the fruit-growers' associations requested that investigations be made into this disease which had now been declared to be due to neither insect, fungus, nor bacterial activities. Scientific investigators in all parts of the world had expressed this opinion. Impatient of delay, the Australian National Fruitgrowers' Conference held in Melbourne in 1908, brought the subject under the notice of the Federal Minister of Customs and the meeting of the same body in Perth in the following year caused it to be brought under the notice of the Annual Conference of the State Ministers of Agriculture "with a view to the appointment of a board to consist of two growers and one scientist from each State who should be instructed to endeavour to ascertain the cause, nature, and preventive means of Bitter Pit."

The Ministers' Conference discussed the proposal and suggested as the trouble was Commonwealth wide the Commonwealth Government be asked to contribute half the cost of an investigation and the States of Tasmania, Victoria, New South Wales, South Australia. and Western Australia share equally the remaining half cost. The final result of this agitation was that the Commonwealth Government offered to contribute £1,000 per annum for four years towards the research, and accepted the recommendation of the Conference of Australian Fruitgrowers' Associations held in Hobart in 1910, that the services of Mr. D. McAlpine, the then consulting Plant Pathologist to the Victorian Department of Agriculture, be secured to undertake the investigation.

In August, 1911, this investigation began and was terminated in 1916. During this period of five years Mr. McAlpine, with that industry, zeal, and care which characterised all of the work of this pioneer in Vegetable Pathology in Australia, collected together into five annual progress reports practically all that was known relative to the disease up to that period.

The time was evidently too short to permit of much definite scientific research being accomplished, particularly by a single investigator. Besides collecting and co-ordinating much scattered evidence—mostly based on opinions and not on the results of carefully guarded experimental data—this investigation did not carry the expectant orchardists much further towards the desired goal of knowing how to avoid or prevent the losses due to the occurrence of Bitter Pit in their apple crops. As Dr. Barker has pointed out the cause is still unknown, though the nature of the defect produced in the apple is better understood and many of the characteristics displayed by it proved to be constant all the world over wherever the disease occurs. McAlpine's conclusion as to the primary cause of the disease (see page 66, fifth report, 1915-16) does not carry us much further than that contained in the assertion of the grower quoted in Crawford's statement compiled in 1886. Whilst McAlpine, like most of the more recent investigators, claimed to have solved the problem of how to avoid the wastage arising from the development of this disease in apples during land storage or overseas transport, the major problem of how to prevent or definitely modify the occurrence of Bitter Pit and its allied "cork" diseases in the orchard remains unsolved.

Following upon the statement published by the writer in the *South Australian Journal of Agriculture* in January, 1905, in which the failure thus far of scientific investigators to determine the presence of any causal organism in connection with the diseased tissues of the apples affected by Bitter Pit was duly noted, steps were taken to place under test certain items of orchard research referred to therein. In 1907, as soon as the nursery was established on the site of the then recently acquired land of the State Orchard at Hackney Road, Adelaide, this was one of the first matters taken in hand. The propagation of a series of apple trees was begun, with the object of testing the preventive effects, if any, of certain rootstocks and/or intermediate stem-pieces on the prevalence of Bitter Pit in the fruits of scion varieties declared either to be highly or only moderately susceptible to that disease when grown in the usual manner on Northern Spy rootstocks in commercial orchards. The selection of the varieties of apples from which these rootstocks and stem-pieces were drawn was based on the assumption that in the absence of a causal organism in the diseased lesions, the defect known as Bitter Pit in the fruit must arise from some inherent defect in the particular variety of apple tree which consistently bore such diseased fruit when subject to certain observed environmental conditions or influences.

It was argued, therefore, that to use as a rootstock a variety of apple, the fruits of which displayed a high degree of susceptibility to this disease, might reasonably be suspected of exercising a predisposing or aggravating influence on that tendency in any other variety which also displayed susceptibility to develop Bitter Pit in its fruits. Conversely, it was assumed that a rootstock or intermediate stem-piece of a variety, the fruit of which displayed immunity from, or high resistance to, the development of Bitter Pit, might be expected to exercise some restraining influence on the occurrence of the disease in the fruits of a variety in which it ordinarily appeared.

The Stocks Selected for Trial.

In McAlpine's first progress report for 1911-12, pages 31-33, closely comparative lists of popular varieties of apple are quoted from all States of the Commonwealth. In respect to most of the sorts which recur in these lists the classification as to the respective degrees of susceptibility of their fruits to Bitter Pit shows a remarkable uniformity in all instances. Although, as previously remarked, these classifications were not based on careful countings or weighings of the diseased portions of the crops. Still it must be admitted that some credence should be given to the conclusions reached in matters of this kind by a number of independent observers, more especially when they were scattered over the apple-growing areas of a continent.

The three varieties selected for rootstocks in the Bitter Pit test plot established in the Blackwood State Orchard were all classed as "Blightproof," *i.e.*, they were considered to be practically immune from the injuries caused by the so-called Woolly Aphis or American Blight, known to science as *Eriosoma* (*Schizoneura*) *lanigera*, Haus.

They consisted of the *Northern Spy*, representing the rootstock commercially adopted throughout Australasia in the propagation of apple trees. The fruit of this variety is listed in McAlpine's report as being badly affected by Bitter Pit in all the States of the Commonwealth.

The *Winter Majetin*, which produces a medium-sized, partially-green or dull brownish-red coloured fruit, was valued at one time as a good late-keeping apple for culinary purposes. It was tried in the early days of experimenting with Blightproof rootstocks, but, owing to propagational disabilities, it fell into disfavour and few trees of the variety are now found in the orchards of this State. Its fruit is listed by McAlpine as being observed for the occurrence of Bitter Pit in the States of Victoria, New South Wales, and South Australia only, and recorded as either very slightly or seldom attacked by this disease.

The third rootstock variety is known as Cole's Blightproof Paradise. It is an apple claimed to have been raised and distributed by John C. Cole and Son many years ago when that firm was amongst the most prominent Victorian nurserymen operating near Melbourne. This firm specialised on fruit trees and are remembered chiefly because of having produced three new varieties of pears which are still in commerce, known throughout Australia as Winter Cole, Madam Cole, and Elizabeth Cole.

This apple tree was brought forward as a dwarfing and Blightproof stock, but from only a limited experience with its use, the writer doubts if the former claim can be sustained, at any rate, when the trees are planted in deep rich soil. It certainly is not to the writer's knowledge affected by Woolly Aphides in South Australian orchards, neither has its fruit been found to be affected by Bitter Pit. The tree, however, has not been widely planted as a rootstock, nor grown for its fruits.

In the older nursery beds at the Blackwood State Orchard some 50 trees placed in reserve for propagating purposes at the time these Bitter Pit trials were inaugurated have grown up like a hedge in the deep rich alluvial soil. These trees have cropped very prolifically for many years, during which time neither the Orchard Manager nor the writer can recall having seen any evidence of Bitter Pit or allied "cork" diseases in the sweet, very white flesh of these roundish, oblate, below medium-sized pale-green skinned fruits.

The varieties selected for the intermediate stem-pieces, where such were used in the first propagations made in 1907, consisted of Dunn's Seedling and Rokewood, both of which bear firm-fleshed fruits and both are seedlings of Australian origin. At the time of selecting these two commercial varieties, the writer had not seen the "Bitter Pit" in any form attacking their fruits. In later years, however, fruits of the Dunn's Seedling, originating from different orchards in South Australia, have occasionally been noted as somewhat freely attacked by it. McAlpine's census of 1912 returns it as "free" in New South Wales and "slight" or "seldom affected" in Victoria, and South and Western Australian orchards. It is not mentioned in lists compiled in Tasmania and Queensland. Rokewood is listed as "free from Bitter Pit" in returns from New South Wales and South Australia, but there is no mention of it in lists from the other four States, although at the time it was largely grown in Western Australia for its long keeping and valuable culinary properties. In the context to these lists, first report, page 47, McAlpine states "Both Rokewood and Monroe's Favourite (Dunn's Seedling) have been found with Bitter Pit in Victoria." The Rome Beauty variety was used as an intermediate stem-piece in the final plantings. The Northern Spy stocks planted in 1911 were budded *in situ* with this variety in 1912. The fruits of this variety are seldom attacked by the ordinary smallpox-like pittings of this disease, but at times large irregularly shaped shrunken areas appear on the periphery, usually towards the calyx end of the apples. McAlpine figures this in his first report, 1911-12, Plate VII., Figs. 32-34 and 37, under the name of Crinkle or Confluent Bitter Pit—a name he had suggested as early as 1901 for this peculiar "pigface"-like formation. In Studies of Bitter Pit, published as C.S.I.R. Bulletin No. 41 in 1929, Carne and his co-workers refer to this defect as "Crinkle Cork." As this defect would appear to be peculiar to a very few varieties of apple, chiefly Five Crown Pippin, Rome Beauty, and Rymer, and then only during some seasons and in scattered localities, it was not deemed to be of equal importance as those more distributed defects classed by recent investigators as various forms of "Cork" and "Pit." The use of Winter Majetin and Cole's Paradise varieties in the role of intermediate stem-pieces was based on the assumed resistance of the fruits of these sorts to Bitter Pit, and on their reputations of possessing some tendency to retard a vigorous growth on the part of varieties grafted on them.

The material used in propagating the trees for these trials was obtained within the State. That of Northern Spy, Winter Majetin, and Cole's Paradise rootstocks was obtained from the nursery of Mr. H. Wicks, sen., of Riverside Nurseries, Payneham, near Adelaide. The trees were developed from segments of the respective kinds grafted on pieces of their own lots. The scion wood used for the intermediate stem-pieces of Dunn's Seedling, Rokewood, and Rome Beauty varieties was procured from trees of their respective sorts grown in the orchard of the late Hon. G. R. Laffer, near Belair, approximately two miles distant northward from the State Orchard at Blackwood.

The scions for the varieties placed under test for Bitter Pit consisted of Baldwin, Cleopatra, Cleopatra Q, Esopus Spitzenburg, Jonathan, and Shockley. Three of these represented at the time our leading varieties of export apples, whilst the others were also exported or grown freely for local markets.

With the exception of Cleopatra Q, all of the parent trees grew in Mr. Laffer's orchard at Belair. They were well matured trees and known to the writer to have produced fruits, more or less, according to the varieties, affected by Bitter Pit over a period of some years. The scions of Cleopatra Q were taken from an old, somewhat stunted tree of this variety which grew in the private fruit garden of the writer in an Adelaide suburb.

In the fruits borne by this tree Bitter Pit had not previously been seen. This tree occupied an indifferently cultivated, dry corner in the garden and the apples were usually somewhat tough and below normal size for the variety. Owing to occasional growers claiming to possess trees of Cleopatra, the fruits of which escaped Bitter Pit, it was assumed by the writer that possibly different trees of an ordinarily susceptible variety might possess some degree of immunity from, or resistance to, the disease. The opportunity of testing this assumption was taken, and in due time scions obtained, though with some difficulty owing to the very restricted annual growths present on the branches.

There is an interesting sequel to the earlier history of this tree which may be briefly stated here.

Two or three seasons after these first scions had been used in propagating trees for these tests the land in which the parent tree stood was levelled and broken deeply prior to manuring it, and planting a crop of summer beans. The bean crop was freely irrigated from time to time and the apple tree also participated in the increased supply of moisture and nutriment. It responded in the form of developing a vigorous growth of shoots and foliage. In the following fruit season the crop of apples, though abundant, consisted mostly of large fruits, the majority of which were ruined by Bitter Pit or Blotchy Cork, as defined by more recent investigators.

In the second series of plantings those trees worked direct on rootstocks of Cole's Paradise and Winter Majetin were planted in 1910 carrying dormant buds cut from the same parent trees of the same fruiting varieties as in Series I., whilst those having intermediate stem-pieces of the Paradise and Majetin grown on Northern Spy rootstocks were budded in 1911 to the fruiting varieties obtained from the sources enumerated above.

This second series of plantings consisting of 24 trees occupies the western portion of the first row, the whole of the second row and a couple of spaces at the eastern end of the third row. The third series consisting of 30 trees, *i.e.*, six trees of each of the more susceptible varieties—Jonathan being omitted—all worked direct on Northern Spy rootstocks occupy the remainder of row 3 and the whole of row 4 in the plot. These trees were also planted in 1910.

The fourth series comprises two trees of each of five distinct varieties—Cleopatra Q now being omitted—were all worked on intermediate stem-pieces of the Rome Beauty variety grown on Northern Spy rootstocks.

These were planted out in 1911 and budded to the respective scion varieties in February 1912.

It should be noted that in each series the material for the respective rootstocks and stem-pieces were taken from the same parent trees, and when the budding of the scion or fruiting varieties took place the budwood was cut from the same parent trees which were growing in Mr. G. R. Laffer's orchard near Belair. It will be seen, therefore, that in propagating the trees contained in each series of the plantings, the whole of the material utilised was, in a genetic sense, as nearly identical as it was possible to obtain. The variations which are deemed to occur from the use of seedling rootstocks, or to arise from grafting with scions taken from the growths of different trees of the same fruiting varieties, should have been eliminated by the procedure followed.

With the exception of the limited numbers of trees of each of the fruiting varieties worked on the respective rootstocks—other than on the Northern Spy—and intermediate stem-pieces, the planning of the tests in most respects would appear to meet the principal requirements of modern horticultural reseach plots.

At the time of planning these tests it was hopefully imagined that, as had been achieved in the case of circumventing the Woolly Blight by the use of the blight-proof rootstocks a generation or two previously, some markedly outstanding difference in the proportion of Bitter Pit affected apples might be detectable amongst the data collected from the trees growing on one or more of the various combinations adopted, the significance of which would prove unmistakable. If modern statistical methods of analysis are found applicable whereby the exact differences in results may be determined from the data herein presented, it is hoped that someone more competent than the writer will find the appended, though much condensed tables of figures, sufficiently informative to render the effort worth while. The Bitter Pit stock trial plot is located at the eastern boundary of the orchard and on the Northern side of the principal roadway which runs through the plantations along the lower half of the southern slope and is shown as Block E in the general plan of the orchard which was published in the first instalment of this report. It is a long, narrow, rectangular strip with the fourth and fifth rows broken somewhat along its northern side by the intrusion of a pumping plant consisting of engine-house, well and large tank-stand, as well as by the sweeping curve of a local creek which traverses the full length of the orchard from east to west. Its longest sides which run almost east and west, measure 420ft. and have a fall towards the west of about 26½in. per chain whilst its shorter sides or ends measure some 86ft. 8in. in length, and fall to the north at an average rate of approximately 32in. per chain. The much greater proportion of this steeper fall occurs between the first and fourth rows from the central orchard roadway.

In the sketch plan of the plot a "dash" line marked "line of soil change" roughly indicates the position in that respect, as north of this line the land becomes almost flat.

Eleven separate examinations were made of the surface and subsoil profiles, viz., in five places along the space between rows 1 and 2, in three positions, between rows 3 and 4 and in three places along the northern margin immediately outside the spread of the trees in row 5.

Between rows 1 and 2 the surface soil ranged between a depth of 9in. and 18in.—average 12½in. This is a dust-like combination of particles of sand and clay in an extremely fine state of subdivision, being dry in the summer when surface tilled, but setting hard in the unbroken portion beneath the tillage depth. It is only slightly humified in the top 9in. and carries a thin band of small nodules of ironstone gravel in the lower portion of this layer. The subsoil consists of a bright chrome-yellow coloured clay, crumbly when moist, but very hard set when dried out. Ironstone particles were scattered through this clay. This clay layer ranged in depth from 29in. to 32in.—averaging 30in. No rocky formation was met in these tests. Between rows 3 and 4 the surface soil varied in depths from 18in. to 21in.—averaging 19in. It varied from 21in. of dark humified loam at the eastern end to a dark sandy loam intermixed with ironstone gravel at the western end of the plot. The subsoils ranged from 13in. to 32½in. in depth—averaging 24.8in. They varied from a pale yellow hard clay beneath the deep humified surface deposit at the eastern end—within the line of "soil change" on plan—to the deep chrome coloured, crumbling, gritty clay, with broken stones intermixed, further towards the western end.

Outside row 5 the surface soil consisted of dark almost black highly humified clayish loam, evidently an alluvial deposit from the local creek. This layer was of very variable thickness ranging from 14in. to 24in. in depth—average 17½in. The subsoils also varied from a depth of 16in. to 32in. before the shelving mudstone (slate) rock was met. The average depth was 24½in. above this stone. The subsoil consisted of dark greyish clay at the eastern end and gradually running into the deep chrome yellow, gritty clay towards the western half of the main fall of the plot.

In 1912 two samples each of surface soils and subsoils each to a depth of 9in. were taken from between the first and second rows at points about one-fourth of their length from the eastern and western ends respectively. These were submitted to the Department of Chemistry for analysis, and with the exceptions of Potash and Lime the constituents in both positions showed only slight variations. The average percentage of the principal elements of soil fertility contained in them were, with the exception of potash in the subsoil, below what has been deemed essential to soils of average fertility in older countries. The averages are as under:—

	Nitrogen (N).	Phos. Acid (P_2O_5).	Potash (K_2O).	Lime (CaO).	Fine Earth (Less than 1 m.m. in Diameter).
	%	%	%	%	%
Surface soils	·0894	·0555	·2535	·231	92
Subsoils	·0530	·0585	·3175	·294	87·75

These surface soils approximate, however, in the percentages of these constituents to those quoted from 10 typical South Australian orchards and vineyards as stated in the first instalment of this report published in the *Journal of Agriculture of South Australia* for March, 1935.

The Development of the Trees.

The trees in this plot were, as in previous plots described in this report, set out at distances of 20ft. apart on the septuple or equilateral triangular system of arrangement. During the earlier years which preceded the fruiting period the trees in each of the series displayed, with few exceptions, average vigour—gauged by the standard of development afforded by the growth of hundreds of apple trees scattered throughout various blocks in the orchard area.

Owing to the ages of the trees planted in the respective series, and the individual growth characteristics of the varieties differing, a considerable lack of regularity in the sizes of those even of the same variety, was noticeable throughout the plot. The usual pruning deemed desirable for obtaining a well-balanced top was applied to all of the trees, particularly during the pre-fruiting period. As fruit production increased, and neither manures nor irrigation being resorted to, the vigour of vegetation gradually subsided and by the time normally full crops were being harvested the pruning had mainly receded into merely an annual, light topping of the leading shoots and shortening back of unduly long or declining laterals during the dormant period of each year. Whilst the crops were still limited the trees were relieved of apples seen to be definitely "pitted" and from time to time windfalls were collected with scrupulous care and the diseased specimens sorted out and recorded. This procedure was applied to each individual tree in the whole plot. For a number of years a record of the apples affected by Bitter Pit—or Cork—from many of the horizontal laterals and branches, as apart from those borne on the vertical limbs, was kept in respect to a number of the trees. Up to the season 1920 the fruit when finally harvested was carried to the packing shed, graded into sizes rising by half inches from 2in. or under in diameter up to 3½in. and then sorted into "pitted" and "sound" groups and thus separately weighed and recorded from each tree in the plot. The "sound" fruit was then kept in a fruit store built with walls and ceiling insulated with a 4in.

thickness of solidly rammed cork shavings and fitted with controllable ventilation apertures entering from beneath the floor, but not otherwise artificially cooled. If not entered frequently during the daytime, the temperature usually ranged from 60° F. downwards from the harvesting period (March-April) onwards. These fruits were again examined at intervals of from 14 days upwards over a period extending up to two months and the further development of Bitter Pit recorded.

It should be explained here that in collecting data the term "Bitter Pit" is used in its widest sense throughout this report, and no distinction made between the forms now referred to by later investigators as separate diseases under the terms of "Blotchy Cork," "Crinkle Cork," "Drought Spot Cork," "Internal Cork," "Tree Pit," or "Storage Pit." All of these forms as defined by Carne and his co-workers have been more or less noted, but those principally in evidence in the apples recorded from the trees in these trials would conform to "Blotchy Cork" when found before or during harvesting time and to "Storage Pit" at a later period.

As the crops began to increase in magnitude the details relative to the fruits borne on horizontal and upright branches respectively and of the storage and subsequent examinations of the individual apples had to be abandoned owing to the staff available not being able to cope with this and the other seasonable work undertaken in the orchard. The Manager (Mr. R. Fowler) and his assistants continued, however, to record with scrupulous care the total weight of fruit borne by each tree in the plot, to grade and sort out the "pitted" from the "sound" apples, and keep a careful record of the respective weights of same in each respective grade.

As this portion of the report attempts to deal with the influence of the rootstocks only on the prevalence of Bitter Pit in the fruits, other features covered by the accumulated data are left for some future analysis. The results of the observations of all research workers and practical orchardists indicate that the occurrence of this diseased condition in apples is intimately bound up with the nature of the growth of the tree on which they are borne.

The consensus of opinions indicate that the intensity of the disease appears to increase or diminish with the vigour of vegetation in each individual tree of a susceptible kind. Fruit tree propagators generally accept the view that the influence exercised by a rootstock or an intermediate stem-piece is usually evidenced by an increased or diminished growth on the part of the fruiting variety worked thereon.

Whilst progressive measurements were not taken of the expansion of the trunk or the extension of the limb growths of each of the trees during the course of the trials, a carefully collected series of measurements was made in March, 1935, embodying the circumferences or girths of each rootstock immediately below the point of union of stock with scion and of the tree stem itself at a position between 10in. and 12in. from the ground-line.

Wherever an intermediate stem-piece was inserted the girth of this was also measured at a point midway along its length. The mean height and spread attained by the limbs of each tree was also measured and recorded. In making these latter measurements the mean accepted height represented not the altitude reached by one, or perhaps two very upright leading shoots, but the average from the whole balanced framework. The mean spread was calculated from transverse measurements made at the same altitude and approximately at right angles to each other across the greatest spread available in that direction. Viewing the trees critically in conjunction with these measurements, the writer concluded that the mean spread—notwithstanding scattered evidences of the shortening in done by the pruners during certain seasons—of each tree's crown, may at this stage, be taken as probably the best index to the development achieved generally by the tree.

Mature trees, now somewhat stunted in their limb growths, sometimes exhibit an exaggerated thickness through the trunks, seemingly quite out of proportion to the superstructures borne thereon. It was noted that some of the trees formerly of the Baldwin and Shockley varieties which in 1927 and 1929 had been top grafted on the main limbs about a foot above their junctions with the trunk to the vigorous growing Tasma, Statesman and Granny Smith varieties, thickened considerably in the trunks. It must be admitted, however, where pruning procedure has been directed towards keeping the tops of the trees within what is deemed to be economic heights and spread, their dimensions tend to assume certain artificially induced resemblances.

In the sketch plan of the plot presented herewith an endeavour has been made to show the respective developments of the trees by the mean spread of each tree's crown in the form of a circle drawn to a scale of 1m.m. to each foot of limb spread. To make the letters pertaining to each circle in the sketch plan quite clear to the reader, the following explanation is given:—The name of the scion or fruiting variety under test is abbreviated to half length, *viz.*, Bald. for Baldwin, Cleo. for Cleopatra, Jon. for Jonathan, Shoc. for Shockley, and Spitz. for Esopus Spitzenburg.

Wherever the abbreviation G.S. or Tas. or Stsm. occur below Bald. or Shoc., it is intended to convey either that Granny Smith, Tasma (sometimes called Democrat) or Statesman varieties have been top-grafted on to the limb of mature trees of one of the above-mentioned varieties.

In respect to the rootstocks used, the letters or abbreviations printed below the name of one of the scion varieties are as follows:—S equals Northern Spy, Par. equals Cole's Blight-proof Paradise, Maj. equals Winter Majetin. Wherever the intermediate stem-pieces are inserted their abbreviations precede that of the actual rootstock in that D.S. equals Dunn's Seedling on Northern Spy, R.S. for Rokewood on Northern Spy, Par. S. for Cole's Paradise on Northern Spy, Maj.S. Winter Majetin on Northern Spy, and R.B.S. equals Rome Beauty on Northern Spy. To give a single complete interpretation of the legend pertaining to the first tree in the top row it is desired to convey that Baldwin is the fruiting variety and it has been worked on to a Dunn's Seedling intermediate stem-piece which has been already propagated on Northern Spy rootstock.

It may be mentioned that in no instance, where a rootstock was united direct to the fruiting variety nor where an intermediate stem-piece had been inserted between any of the three rootstocks and the fruiting variety, could any outward manifestation of incompatibility be discerned between them. This is in marked contrast with the recorded behaviour of the rootstocks of Cherry, Pear and Peach, excepting where the particular rootstock—as in the case of these apple stocks—was of the same genetic origin as the fruiting variety worked upon it. It was further noted that the Winter Majetin rootstocks and stem-pieces retained a smooth, dark, greyish-green, healthy-looking bark, whilst the Cole's Paradise in all cases exhibited a somewhat roughened brownish appearance. These differences in appearance was so well maintained that little difficulty was experienced in tracing the identity of the rootstocks or stem-pieces originally used in the propagation of these now mature apple trees.

(*To be continued.*)

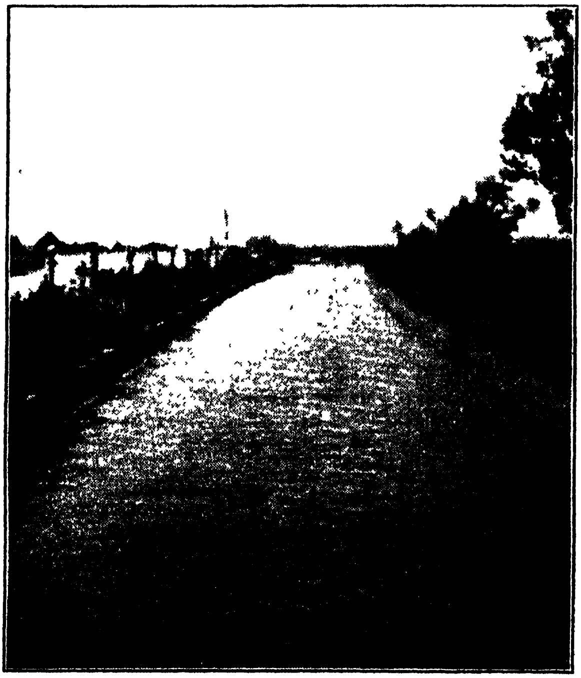
IRRIGATION AND DRAINAGE.

[By F. R. Arndt, Horticultural Instructor of the Murray Irrigation Areas.]

(A paper read at the Conference of River Murray Branches of the Agricultural Bureau, Moorook, June 20th, 1935.)

Although irrigation has now been practised along the Murray Valley for upwards of 40 years, and much experience has been gained in the art of applying water to the land, it is still a subject that presents considerable difficulties to fruit-growers, and there are still many problems connected with it that are only partially solved.

Indeed, during recent years, irrigation problems have increased in many districts, and a rise in the water table—often accompanied by an accumulation of injurious salts in the root zone of the plants—has occurred in many places. An examination of the chief factors governing successful irrigation practice, and of the main causes of salt and seepage troubles, should, therefore, at the present time, not be out of place, and in this paper an endeavour has been made to show how many of the difficulties confronting irrigationists have been caused and how they may be overcome.



Concrete-lined main channel.

CONSTRUCTION OF MAIN IRRIGATION CHANNELS.

The first essential in the laying out of an irrigation area is, of course, the delivery of the water on to the land. The actual method of supplying the water, whether by means of various kinds of power pumps or by gravitation, is purely an engineering one, but as soon as the water is delivered into the main channeling or piping system, the province of the irrigationist begins.

In most irrigation areas the water is delivered to the various holdings by means of open channels. Where the land is of a sandy, porous nature, the main channels are generally lined either with lime or cement concrete, to prevent loss of water by seepage through the floor and sides of the channels, but on firmer types of land they are often just earth ditches.

Such earth channels are usually left unlined on the score of economy; but it is very doubtful if they ultimately make for true economy, for although the loss of water by seepage through the sides and bottoms of such channels is much less on firm than on loose land, nevertheless a considerable amount of water soaks through in time, and helps to build up a watertable in the surrounding country, unless the underdrainage of the land is very good.

The baneful effects of unlined main earth channels may be seen in places on the irrigation areas, where the sides of the channels and lands in their vicinity are often highly impregnated with salt, while the general rise in the water table that is taking place in such areas must to a great extent be reinforced from the seepage from these channels.

Watering vines on the furrow system.

It is advisable, therefore, that all main channels should be concrete-lined, as the planting of gums or willows along unlined channels to take up the surplus moisture—as is sometimes done, although of help—usually does not remove all of the water, to say nothing of the salt that exudes from these channels during an irrigation season.

MOISTURE REQUIREMENTS OF PLANTS.

The first thing that should be considered in the watering of a piece of land is that each plant growing upon it receives sufficient water for its needs. Where each row—or larger section of land—is devoted to one class of plant, as is usual in commercial orchards and vineyards, the moisture requirements of the individual plants will be practically the same, and, therefore, each plant should receive as nearly as possible the same amount of water.

Rain—Nature's method of watering—gives to every plant in the orchard the same amount of water, and it should be the objective of the irrigationist to follow Nature in this respect as closely as possible.

IRRIGATION SYSTEMS.

The irrigation of orchards and vineyards is now practically confined to three different systems of watering—the Sprinkler system, the Flooding system, and the Furrow system, of which the Flooding and Furrow systems are the ones chiefly used.

THE SPRINKLER SYSTEM.

Theoretically, this is the most perfect of the various systems, as it approaches most nearly to Nature's method of watering—rain—and gives a far more even distribution of water than is possible by the furrow system. Land that is watered by this system does not require nearly so much grading as is the case where either the Flooding or the Furrow systems are used, and as the watering is applied evenly over the surface of the ground, waterlogging of the subsoil, with the danger of seepage resulting therefrom, is reduced to a minimum if the water is at all intelligently applied.

The chief advantages of the Sprinkler system may be briefly stated as follows:—

1. It gives a more even distribution of water than is possible by the Furrow system.
2. It allows for the penetration of the water into the soil to be more easily controlled than is the case with the Furrow system, so that this may be regulated in order not to extend more deeply into the soil than that reached by the roots of the plants, thus preventing the waterlogging of the subsoil.
3. It carries the fertilizing elements contained in the surface soil down to the roots of the plants, whereas with the Furrow system a great portion of the surface soil is often not wetted at all.
4. Through the downward percolation of the water, such salts as may have been drawn by evaporation to the surface of the ground or into the root zone of the plants, are carried further down into the subsoil where they are less dangerous to plant life.

SPRINKLER IRRIGATION ON A COMMERCIAL SCALE.

Advices from the United States of America indicate that Sprinkler irrigation on a commercial scale has made considerable progress in that country, chiefly in California, where a large number of citrus plantations are now watered on the Overhead system.

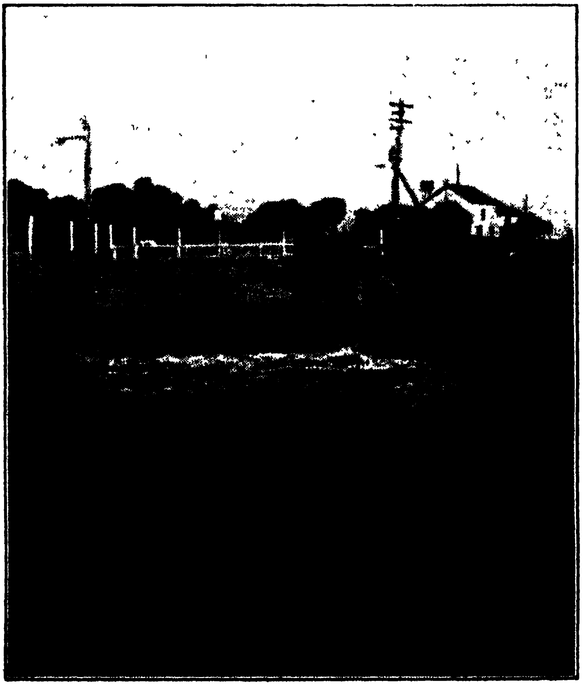
Overhead orchard irrigation is also practised to some extent in Australia, and the writer has seen this system at work on orange trees at Gilles Plains, in the Torrens Valley, near Adelaide, on the New South Wales side of the Murray, opposite Cobram, and on the plantations of Messrs. B. H. Jungfer and R. M. Wilksch, of Berri.

At Gilles Plains the water is pumped from the River Torrens, and the sprinklers worked from iron pipes by lengths of rubber hose attached to these, so that the sprinklers can be lifted from place to place when portions of the orchard have had sufficient water. At Cobram the water is pumped from the Murray direct into strong galvanized iron piping, and watered by means of the "Nunan" system, while at Berri the trees are watered by the "Pope" system—in the case of Mr. Jungfer the water being forced into the galvanized iron piping by means of a power pump, and in that of Mr. Wilksch the pipes being fed from an open channel situated on high ground and the sprinklers worked on lower levels by the force of gravity.

In all of these plantations the trees responded well to these methods of watering, making strong, healthy, green foliage, and bearing good crops. In visiting a citrus grove of 14 acres near Cobram—watered by means of Sprinkler irrigation—not a single yellow or mottled leaf was noticed in the whole orchard.

The reason why Sprinkler irrigation has not become more popular is due chiefly to the greater cost of installation as compared with open channel watering; and as the irrigation areas are at present laid out, the expense of substituting piping for channeling would be so great that the older methods of watering are, in most cases, likely to remain for the present.

However, owing to the success that has already attended the watering of plants by the Overhead system of irrigation, and on account of the many advantages in its favour—the chief of which is the practical elimination of the seepage problem—it seems reasonable to suppose that this method of watering will, in time, be much more widely used, and that it may ultimately supersede, to a considerable extent, some of our present methods of orchard irrigation.



Main irrigation channel at Berri.

THE FLOODING OR CHECK SYSTEM.

Land that is watered by the Flooding or Check system is graded perfectly level, and is then surrounded by a check bank. Water is let in at one end and the land is flooded, the check bank confining the water to the enclosed piece of land.

By this means the whole of the land receives an even watering, and on some classes of land this system of irrigation has been used with considerable success.

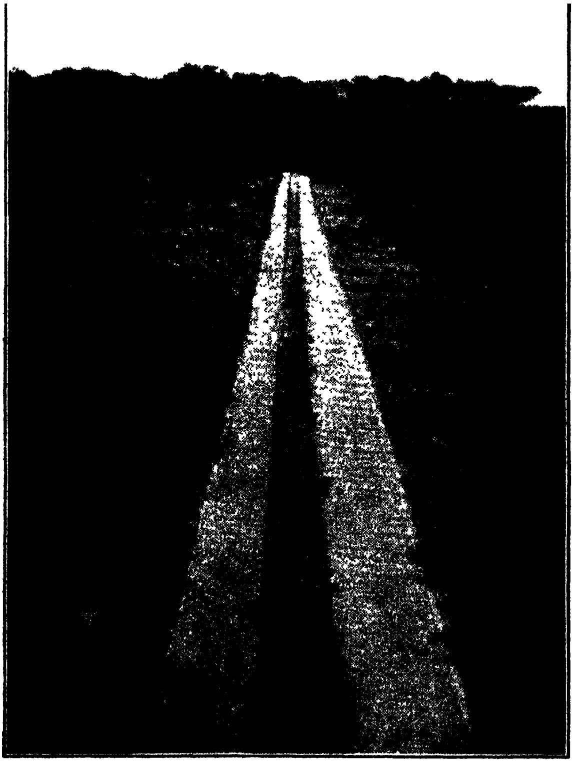
The use of the Flooding system of watering is chiefly confined to the firm, heavy soils of the river-flat lands, which absorb water only very slowly, and where the Furrow method of irrigation does not always give a satisfactory watering.

On soils of a sandy nature, however—as those usually found on the upland rises, and which absorb water very quickly—this method of watering is highly dangerous, and should be used only in exceptional instances (such as the leaching of salty lands that have been drained), because waterlogging of the subsoil may result therefrom, with the possibility of the surplus water appearing as seepage lower down the slope.

Furrow Irrigation.

Because of its greater simplicity as well as the fact that land can be more cheaply laid out for watering by this method than by any other means of applying water to the land, the Furrow system of watering is the one usually practised in orchards and vineyards.

By this method of irrigation one or more furrows are ploughed each side of the rows of trees and vines to be watered, and the water is allowed to run along them until the end trees or vines have had sufficient.



Concrete channel in orchard.

The chief disadvantage of this system of irrigation is that the plants situated at the beginning of a row must necessarily receive more water than those further along, and that an ideal watering, whereby each plant receives the same amount of water, cannot be attained by this method of watering.

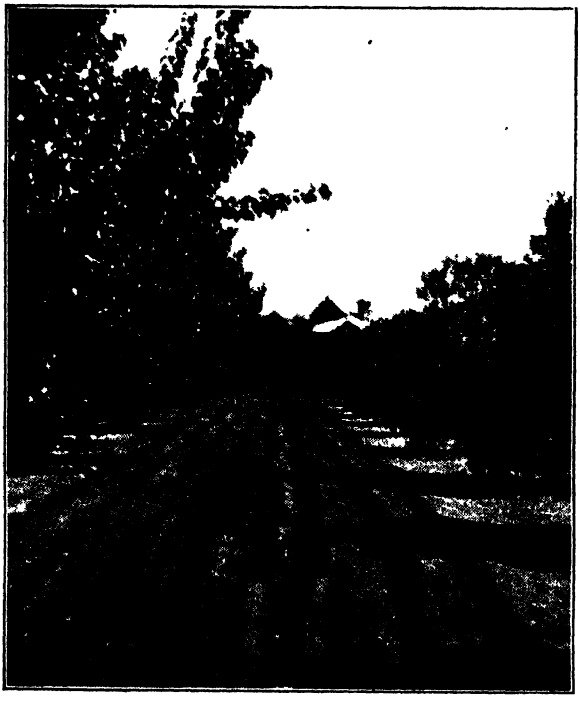
It is necessary, therefore, if satisfactory results are to be obtained, that every effort be made to minimise the disadvantages of Furrow irrigation as much as possible, by correctly laying out the land for watering, and by using efficient methods of water application.

POSITION OF CHANNELS AND LENGTH OF ROWS.

The first thing that has to be considered in preparing a piece of land for watering is where the channels are put down, for upon their position depends the length of the rows of trees and vines to be watered.

Experience has shown that on loose, sandy loam, rows 5 chains in length are long enough, but that on hard flat land, a run longer than this may often be used with safety.

As by the Furrow system of irrigation, the water is flowing for a considerable time past the first trees of a row before it reaches the last ones, the longer the rows are, the longer will the water take to reach the end. The result is that, on long rows, by the time the last trees have had sufficient water, the first ones will have had too much, and the surplus water, applied at the top of the rows, may come out as seepage lower down the slope, should the subsoil at any place come close to the surface of the ground.



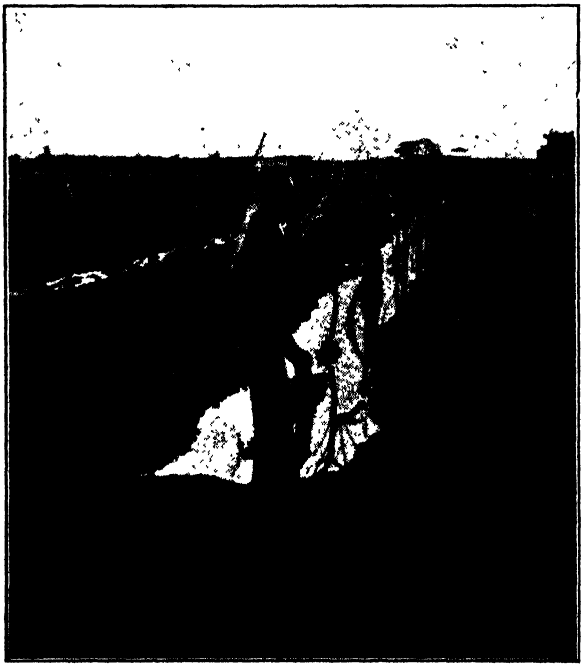
Orchard prepared for multiple furrow irrigation.

Where the orchard has in the first place been laid out with rows that are too long for the satisfactory watering of the land, it is advisable that the irrigation runs be shortened, which may be done by dividing the rows either by means of open channeling, or by the installation of a system of concrete piping put into the ground sufficiently deep so that it does not interfere with tillage operations, by which means the whole of the land would receive a more even watering than was previously the case.

GRADE OF WATERING.

The grade along which to water is also an important factor that has to be taken into consideration when laying out the land for watering.

On sandy land, owing to the porous nature of the soil, a greater fall along which to irrigate has to be given than on firmer land, for by watering along an almost level grade on sandy land, the water sinks so rapidly into the soil that the top end of the rows of the plants watered get too much before the bottom ones have had sufficient, with the danger of seepage appearing lower down the slope in time. Therefore, it is generally not safe to water with a fall of less than 4in. to the chain on sandy rises, and on very porous soil it may sometimes be necessary to increase the fall to 6in. to 8in. to the chain, the objective to attain being that but little washing of the soil takes place at the beginning of the rows, while the water reaches the ends of the rows in a reasonable time.



Watering underneath vine trellis to leach salt away from stems of vines.

On firmer soils a considerably smaller grade may be used, because the soil absorbs the water more slowly; for if the grade is at all steep the water reaches the end of the rows too quickly, and the land is not sufficiently wetted. Therefore, the principle to follow in laying out the grade for watering should be—the firmer the land the lesser the grade, and the looser the land the greater the grade—so that the plants may receive, so far as the Furrow system of irrigation will allow, as nearly as possible the same amount of water.

METHODS OF WATERING.

WATERING WITH TWO FURROWS TO THE ROW.

Although the objective of good irrigation practice should be to give the land as even a watering as possible, watering by means of a single furrow along each side of the rows of trees or vines is a method that is still often used by some growers.

With such a method of watering among vines planted in rows 12ft. apart there will be two furrows in between each row; and if a spread of 1ft. is allowed in each furrow for the water to run over, then only 2ft. out of the 12ft. or one-sixth of the land, will be flooded with water. Where an irrigation of 4 acre inches is given, this will consequently be concentrated on one-sixth of the land, making a total of 24in. on the land actually flooded with water; but where the water has only run over 6in. of land at the bottom of the furrows—as is often the case—then the land flooded with water will receive an irrigation twice as heavy as this.

As the main movement of the water is downwards, a considerable portion of it—particularly in deep sandy land—will sink down into the subsoil beyond the reach of the roots of plants. In addition, the water in passing through the soil will carry some of the more easily dissolved plant foods, such as nitrates, down with it, which will thereby be lost to the plants. The greatest objection, however, to saturating the subsoil with water is that seepage may result therefrom, which will occur where the subsoil is of a tenacious nature, and is close to the surface of the ground.

LATERAL MOVEMENT OF WATER.

Besides its downward movement there is also a considerable lateral movement of water running along the irrigation furrows. Where the water soaks straight downwards, such salts as are dissolved by irrigation water are, of course, carried down with it, but in spreading laterally these salts are not carried down so deeply, and are therefore more easily brought to the surface of the ground under the influence of evaporation. Such phenomena may often be observed on land containing considerable quantities of alkali, when after an irrigation the tops and outer sides of the irrigation furrows, where no water has been applied, are often covered with salt; whereas no such occurrence is noticeable at the bottom of the furrows, where the salts have been removed by the leaching action of the water.

This lateral movement of alkali may often be traced for a considerable distance on each side of the irrigation furrows, sometimes for 1ft. to 2ft., or even further, after a heavy watering. It is apparent, therefore, that in watering an orchard or vineyard with one set of furrows on each side of the row, and in leaving the middle portion of the land unwatered, after a time a considerable proportion of the salts contained in the soil will be forced to accumulate in two belts—one in the strip of land in between the irrigation furrows, and the other along the rows of trees or vines.

Salts that are detrimental to plant life may not cause any serious damage to vegetation if they are fairly evenly distributed throughout 5ft. to 6ft. of soil, but when concentrated in the first foot of soil, may be of such strength as to make plant life impossible. It is essential, therefore, that in watering, every effort should be made to prevent the accumulation of salts at any place.

WATERING WITH MULTIPLE FURROWS.

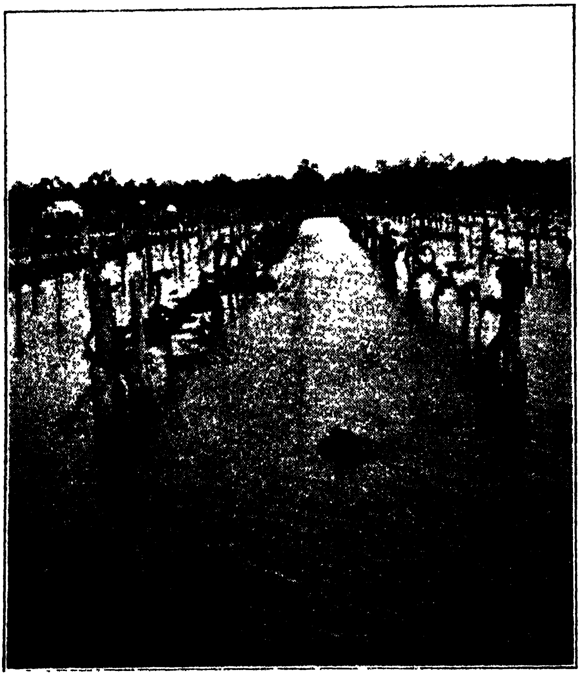
As has been previously mentioned, when land is watered by the Sprinkler and Flooding systems, the movement of the water is in a downward and not in a lateral direction; and if the best results are to be obtained from the Furrow method, it is necessary that the water should be applied in a manner that will cause a maximum quantity to soak downwards into the soil.

This, to a considerable extent, can be effected by watering with numerous furrows close together, whereby a considerable portion of the land, namely, all of that situated at the bottom of the furrows, is flooded. This will result in a larger proportion of the water applied soaking in a downward direction, than where fewer furrows are used, and in addition, the land will receive a more even watering.

Of course, in watering with multiple furrows, the water must not be kept running as long in each furrow as if fewer furrows are used, or the land will be over-watered. With this method of irrigation the water must be run along the furrows fairly quickly without, of course, causing washing of the soil at the top of the rows. To prevent the accumulation of too much overflow water at the ends of the rows at one time, the watering may be so arranged that only one or two furrows in between each row of trees or vines are watered at one time.

To thoroughly wet the surface layers of the soil, but at the same time prevent the water from sinking too deeply into the subsoil, it is necessary to water with fairly large streams along the furrows for a comparatively short time, so that the land is not wetted to a much greater depth than that reached by the roots of the plants.

Regarding the distance that the irrigation furrows should be from each other to give an even watering, these may be spaced—where the land has been given a suitable grade for watering- not more than 2ft. from each other. Among vines planted in rows 12ft. apart this would give not less than four furrows to the row, whilst among fruit trees there would be from about six to ten furrows to the row, according to the extent that the spread of the foliage had restricted the area of land where furrowing could take place.



Watering vines on the flooding system at winter irrigation.

The advantages of watering with numerous, as compared with fewer, furrows, may be briefly stated as follows:—

Firstly—The trees and vines receive a more even watering.

Secondly—The subsoil is less soaked with water, thereby lessening the danger from seepage.

Thirdly—The plant foods contained in the surface soil including artificial fertilisers, are not carried down too deeply into the subsoil beyond the reach of the roots of the plants.

Fourthly—Such alkalies as are contained in the soil that are injurious to plant life are thereby kept more evenly distributed, and are thus—to a greater extent—prevented from accumulating in strips on, or near, the surface of the ground, or in the root zone of the plants.

WATERING UNDERNEATH VINE TRELLIS AND FRUIT TREES.

By watering with furrows close together, the concentration of salts in between the rows of trees or vines is greatly lessened; but this is not prevented from occurring along the strip of land occupied by these plants.

Watering by semi-flooding.

It is necessary, therefore, that the land situated underneath vine trellis and fruit trees should also receive regular waterings, and by being flooded once or twice a year, any undue concentration of salt will be prevented from taking place. As the water is applied close to the trees and vines, such floodings can be more conveniently given early in the season, at the time of the first and second irrigations, than later on in the year when the growth of new foliage and the formation of fruit makes work near the trees and vines a more difficult operation.

SEMI-FLOODING.

Another method of irrigation, which is somewhat of a combination of the Flooding and Furrow systems, and which in some cases may often be used with advantage is the Semi-Flooding system of watering.

With this system the land is generally prepared by means of the disc-cultivator, which is so set that when this is driven between the rows of plants to be watered, a shallow depression, usually several feet wide and with check banks on either side, is made lengthwise along the rows.

On some classes of land, where the grade of watering is not too steep to cause undue washing of the soil at the beginning of the rows, this system of watering often gives good results. On loose, sandy land, however, which absorbs water very rapidly, there is a danger that the top portion of the rows may receive too much water before the lower portion has had sufficient, and that the excess water, soaking into the subsoil, may cause seepage and waterlogging of the soil lower down the slope, unless the land is well drained. This method of watering is, therefore, best adapted to land that is not of a very porous nature, and that has been laid out with a grade suitable to this system of irrigation.

DRAINAGE.

As previously pointed out, the objective of good irrigation practice should be the prevention of salt and seepage troubles, but where these have already taken place, efforts should be made to do away with them, or at least to minimise their ill-effects.

As poor drainage is the cause of alkali and seepage troubles, the most natural way to cope with the problem is to improve the drainage system of the affected land. This is usually done by means of an underground system of tile drains along which the surplus soil water is induced to flow, and whereby it is led away from the orchard or vineyard.

The first essential for a successful drainage scheme is, therefore, an assured getaway for the drainage waters. If near a river or lagoon, drainage can take place into these direct, or into a drainage system leading into these.

To cope with the drainage problem, shafts are often sunk until a layer of drift sand is struck, and the water led into these. The drawback to this system of drainage is that unless the layer of drift sand leads directly into the river bed, into a lake, or into the sea, the "sand pocket" must in time fill up with water, and consequently become useless for drainage purposes.

This has already happened in a number of instances on the Murray Irrigation Areas, the wells even overflowing in some cases during the irrigation season. For this reason, the only wise course for the authorities governing the irrigation areas to adopt is to give up the method of well drainage, and to put down a comprehensive system of main pipe drains into which the seepage waters of the various holdings may be drained, and by means of which they can be led right out of the irrigation areas into the river drainage system.

In draining an affected piece of land, trenches possessing an even fall are dug through it, and earthenware pipes are laid at the bottom of them. The depth to which the drains are put down will vary according to the depth of the watertable, the usual depth of the drains on the Murray Irrigation Areas being between 5ft. and 6ft.

In putting in the pipes, these should be laid as evenly and as closely together as possible, and the joints covered with small pieces of oiled or tarred paper, which while preventing the loose earth from getting into the pipes when the trench is being filled in, yet not prevent the water from entering in at the joints. The effectiveness of the drains can be increased, and the danger of silt entering at the joints much minimised, if a layer of coarse river sand or rubble, just sufficient to cover the pipes, is first put in before the soil that has been thrown out in making the drain is again filled in.

Where only seepage (without salt) is present, an effective system of underground tile drainage will soon lower the water table and lead to the reclamation of the land. But where salt has risen with the moisture into the surface layers of soil, the task of bringing the land back into a satisfactory state of production is a much more difficult one. In such cases, the first essential is to endeavour to remove the salt by thoroughly wetting the surface soil by means of Flooding, Semi-flooding, or Multpile Furrow Irrigation, so that as much salt as possible is dissolved and carried off in the drainage waters. Owing to the difficulty of dissolving much of the salt at any one watering, this method of soil reclamation is often a very slow one, and in the case of badly affected land, may take many years.

Irrigationists have at times been puzzled by the occurrence of trees and vines situated on land affected with salt suddenly dying after the land has been drained. This phenomenon can be explained as being due to the influence of the drainage system, which has removed a considerable proportion of the moisture in the soil, but at the same time has left most of the salt behind, with the result that the salt in the remaining soil moisture is of very high concentration and too strong for the plants to withstand. It is necessary, therefore, that plants growing on salt-impregnated land should be given heavier waterings after the land has been drained than they have previously received.

THE REMOVAL OF SURPLUS WATER BY PLANT GROWTH.

Another method of lowering the watertable of seepage lands, which at times may be used with good results, is by the growing of moisture-loving plants.

Where the land is not excessively saline, probably the best kind of plant to grow for this purpose is Lucerne, which on account of its deep rooting system and its ability to absorb large quantities of water, will often appreciably lower the watertable.

Where the land is too salty for Lucerne to start, Barley may probably succeed as a first crop. This should be grown as a winter crop, and can often with advantage be followed by a spring sowing of Japanese Millet. Both of these plants are able to withstand a considerable degree of salt, and may be sown in strips along the rows of trees and vines growing on salt-affected land.

As the objective of the growing of these crops is the lowering of the watertable, they should be watered only sparsely, and after they have been established it may often be advisable not to water them at all for a while, in order to force the plants to absorb as much of the seepage waters as possible, and so dry out the ground. However, as the watertable, in receding, may leave a considerable amount of salt in the surface layers of the soil, it may be necessary, after a while, to give the land one or more comparatively heavy surface waterings, so that these salts may be washed deeply down into the subsoil beyond the reach of the plant roots.

Beneficial Results from Growing Lucerne.

Although the use of plant growth to lower a high water table has, to the present time, not been a method widely practised in the irrigation areas, several instances of its successful application have come under the writer's notice during the past few years. In one case a grower who had seepage among his Orange and Fig trees was advised by the writer to interplant the trees with Lucerne, with the result that within two years the watertable was lowered from 2ft. 6in. to about 6ft., while the trees were greatly improved in health.

In another instance a grower who had put down a tile drain, which was working well, removed a row of weak trees situated parallel to and above it, and in its place planted a 12ft. strip of Lucerne. Although this was not planted near enough for the roots to enter the drainage pipes, yet after the Lucerne was established the drain stopped running, showing that the Lucerne intercepted and absorbed the water as this drained down the slope along the subsoil.

In several other cases it was observed that the growth of Lucerne among trees and vines was helping to keep these alive, although in some places the watertable during the irrigation season was, at times, in the vicinity of 2ft. from the surface of the ground.

It is apparent, therefore, from such instances that in the reclamation of seepage lands the use of plants to remove the surplus water from the soil may often be advantageously employed, and that in place of clean cultivation the growth of Lucerne, Barley, Millet, leguminous cover crops—and at times even weeds—may be of the greatest assistance in helping to bring such lands back to profitable production.

BLACK HENBANE (*HYOSCYAMUS NIGER, L*), A POISONOUS WEED.

[By C. M. Eardley, B.Sc., Curator of the Herbarium, University of Adelaide.]

OCCURRENCE.

A plant recently received for identification from the neighbourhood of the Jamestown stockyards has proved to be *Hyoscyamus niger*, L. "Black or Common Henbane" (also known as "Fetid Nightshade" and "Hog's Bean"). This species is a European poison weed of some notoriety, evidently introduced into South Australia within the last fifteen years or so and, as yet, fortunately limited in its distribution. There are two earlier records of the occurrence of Black Henbane in the State, one from Alma (near Hamley Bridge) dated 1927, and the other from Wolseley in the South-East in 1921. This scattered distribution suggests that there has been more than one centre of introduction, and it will be interesting to find whether the plant has persisted and spread in these localities.

Hyoscyamus niger, L. is not recorded in recent floras of Western Australia or Victoria, though the closely related introduced species *H. albus*, L. is described in Ewart's "Flora of Victoria"; this is also poisonous. The native habitat of Black Henbane is in all parts of Europe, save the cold northern regions, including the British Isles, and extends to northern Africa and eastern India (10); it is also widely distributed in the United States and Canada (1).

POISONOUS PROPERTIES.

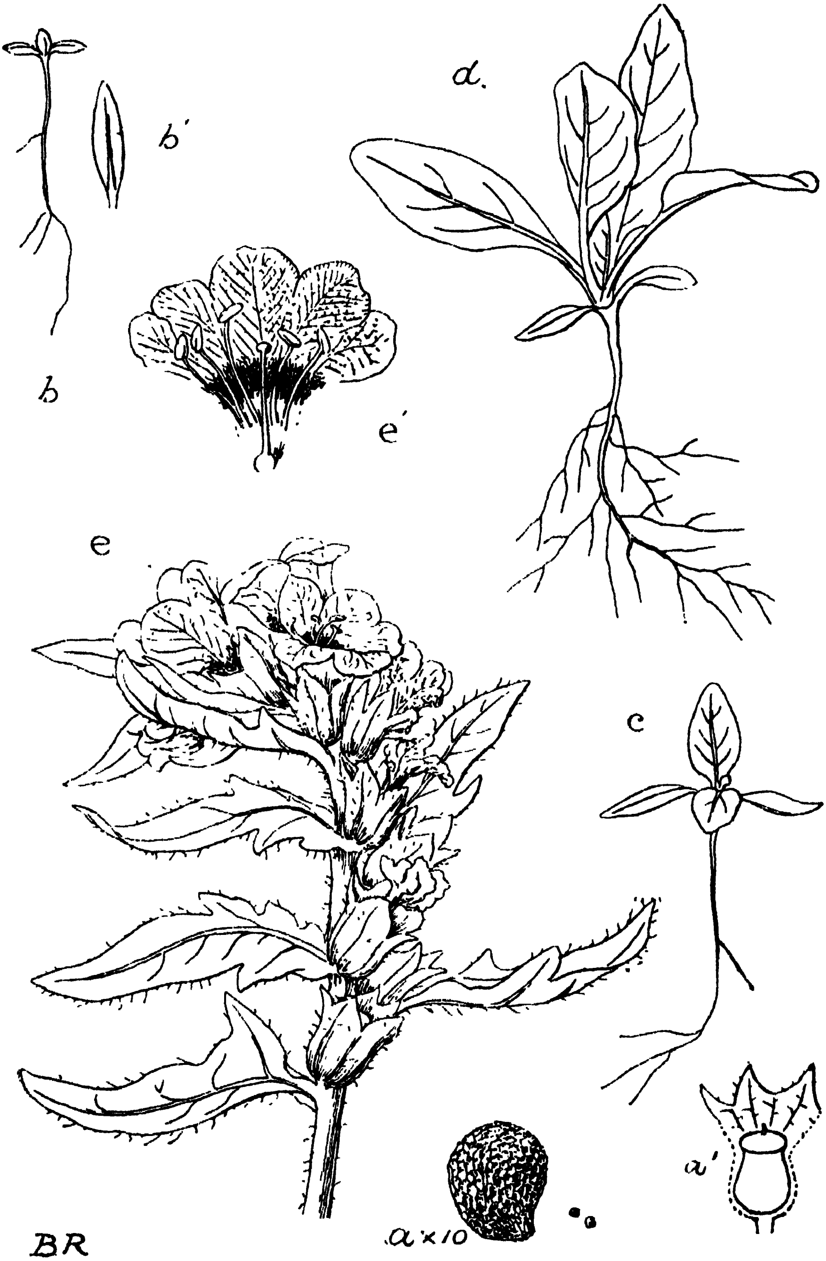
The plant has a repulsive odour and is usually avoided by cattle for this reason, though hogs die of eating the fleshy roots and fowls from picking up the seeds. All parts of the plant are poisonous, even after drying and boiling. Children have been known to die of eating the seeds (4) and adults have been severely poisoned by taking the fleshy root for chicory (2), parsnip, or horse-radish (3). The victims exhibit strange hallucinations for a time (hence the common name of "Insane Root"). Pammel (1) and Long (3) give detailed symptoms of the effects of *Hyoscyamus* poisoning in man and animals, and Pammel also describes the properties of the contained alkaloids, *hyoscyamine* and *scopolamine*, which are the active principles. The plant was formerly cultivated in Europe (9) for the narcotic drugs which were prepared from it.

DESCRIPTION.

Hyoscyamus niger, L. belongs to the family *Solanaceae*, which includes other dangerous plants such as *Datura Stramonium*, L., Thornapple, and *Atropa Belladonna*, L. Deadly Nightshade, also containing powerful alkaloids used in Pharmacy (6).

The following description of *Hyoscyamus niger* is adapted from Ada Georgia (1):—

"A coarse, ill-scented weed, stem stout, one to three feet in height, clothed with sticky hairs. *Leaves*, dark-green, three to six or more inches long, with irregular pointed lobes, wavy edges and sticky hairs on the midribs, alternate, the upper ones sessile and stem-clasping, but the lower ones stalked and drooping on the ground. *Flowers* in a short one-sided cluster at the top of the plant and solitary in the leaf axils; they are funnel-shaped, somewhat unequally five-lobed, nearly two inches broad, *the corolla is greenish-yellow with throat and lobes netted with purple veins*; stamens five, emerging from the corolla and bent downwards, calyx *urn-shaped, with five pointed lobes and five ribs; it enlarges to enclose the oblong capsule*, which is about half an inch long, two-celled *and opens transversely around the top, the latter falling off like a lid*, spilling the numerous seeds. These are kidney-shaped and brown with a strongly netted surface."



Henbane (*Hyoscyamus niger* L.). a—Seed, natural size and x 10 a'—Capsule, natural size. b and b'—Seedling, first stage and seed leaf, x 1. c—Seedling, second stage, x 1. d—Seedling, third stage, x 1. e—Flowering and fruiting branch, x 1. e'—Flower opened to show stamens and pistil, enlarged.

(*After H. C. Long*) *"Poisonous Plants on the Farm."*

APPLE INDUSTRY.

[*The Australian Agricultural Council has received the appended comprehensive report on the economic and scientific problems of the apple industry from the Council for Scientific and Industrial Research.*]

Investigations into the various types of disorders which affect different varieties of apples in storage are being conducted in Tasmania by Mr. W. M. Carne, of the Division of Plant Industry working in co-operation with the Tasmanian Department of Agriculture and the University of Tasmania. These disorders, which are of a very complex nature, are being determined and classified. Definite information is being obtained regarding the conditions under which they are developed, and methods of control are being studied. The investigations are of importance not only with respect to the apple industry, but also in connection with the elimination of unprofitable or undesirable varieties of apples.

Studies of the effects of seasonal climate on the quality and storage capacity of apples are being conducted in conjunction with those on maturity, size of crop, &c., and whilst the effects are obviously difficult to determine, in some cases definite correlations have been found. For example, severe water-core accompanies heat waves in the fruit-growing season, and crinkle follows if the hot conditions are severe and prolonged. If the heat wave occurs during or just prior to picking so that when picked the fruit has water-core, it will develop breakdown in storage.

BEARING PROBLEMS.

Investigations are also being conducted into the problem of alternate light and heavy bearing of apple trees. Except in a few instances, neither manurial, pruning, nor fruit thinning practices have given any satisfactory results with respect to this problem, either in Australia or elsewhere. In the hope that the investigation into the process of fruit bud formation might indicate a point of attack on this problem, the Council's Division of Plant Industry has, in co-operation with the Victorian and South Australian Departments of Agriculture, made studies of the process of fruit bud formation, and the relation of this process to the growth of the tree in apple varieties of both biennial and annual cropping habits. The information thus obtained, whilst increasing our knowledge of the mechanism of the process, emphasises the difficulty of controlling the biennial cropping habit by means of cultural operations performed subsequent to blossom time.

Two lines of further investigation are indicated:—

(i.) The development of a commercial method whereby the heavy blossom of the "on" year may be reduced to an amount sufficient to set a moderate crop.

(ii.) The discovery of strains of varieties, in which the feature alternation is not so pronounced (*vide* citrus). A search of established orchards may result in the discovery of strains possessing the quality of even cropping.

STANTHORPE STOCKS.

In co-operation with the Committee of Direction of Fruit Marketing of Queensland and the Department of Agriculture, an investigation has recently been commenced at Stanthorpe into the question of the type of stock most suited to the requirements of that district. Certain East Malling Stocks are being used and compared with other stocks, such as Northern Spy and seedling stocks, but it will be some years before results are likely to be available.

COLD STORE WASTAGE.

The different types of wastage occurring in Jonathan apples in cold storage and the conditions giving rise to them are being studied intensively in co-operation with the Victorian Department of Agriculture at the Government Cool Stores, Melbourne. The object of the investigations is to determine the effect of maturity, locality, and tree individuality on the keeping qualities of the apple. Satisfactory progress has been made in the work, and it is anticipated that before long it will be possible as a result of the investigations to make definite recommendations regarding Jonathan apples for export, particularly in regard to the degree of maturity at picking.

APPLE CASES.

The Council's Division of Forest Products in co-operation with the Standards Association of Australia has conducted an extensive series of experiments into the most suitable type of cases for apple exports. The evidence which was obtained showed that different types of cases were used in the apple export trade and that serious inconvenience in production, packing, and stowing and adverse comment in marketing resulted. The first step was, therefore, the elimination of a number of undesirable types of cases following on action which had already been taken in this direction by the Apple and Pear Export Council.

Under the Commerce Regulations, two types of cases are now permitted, viz., the Canadian and the dump. The regulations are, however, of a broad nature regarding variations in capacity, and in addition make no provision for the sizes of the individual parts of the case. Commercial cases are accordingly at present far from being standardised.

The results of the experiment showed that a case of the dump shape, enlarged from the statutory 8¾in. width to 9in. in order to accommodate the minimum weight of fruit required by overseas buyers gave the best protection to its contents. An experimental shipment of 540 cases was made by the Council in 1934, but the results were inconclusive. Apparently any difference in respect to liability to bruising which might have existed between the two types of case was hidden by undermined causes of bruising more important than the type of case.

The C.S. & I.R. and the Special Committee on Fruit Cases appointed by the Standards Association of Australia have undertaken sufficiently detailed tests and export trials to show that the question of standardisation of the apple case is influenced at present by factors other than the protective value of the cases. It appears that the industry should make the next decision as to how largely bruising affects the sales value of apple consignments. It should then take the necessary steps to choose a standard which will give the requisite degree of protection and at the same time fulfil the majority of the marketing requirements.

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LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR JUNE, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow December to June.	Per Herd during June.	Per Cow during June.	Per Cow December to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	16	14·80	13,005	812·81	2,263·57	629·51	39·34	115·94	4·84
6/C ..	17	10	7,065	415·58	3,065·91	292·98	17·23	133·30	4·15
6/Y ..	13	8·23	2,137½	164·42	2,720·81	89·05	6·85	114·70	4·17
6/Ff .	27·17	17·97	9,000	331·25	4,167·28	353·48	13·01	174·62	3·93
6/Ii ..	7·30	6·60	4,537½	621·57	4,700·84	187·32	25·66	195·45	4·13
6/Kk	19·70	14	6,780	344·16	3,192·99	260·85	13·24	122·67	3·85
6/Ll .	23·53	14·77	4,947½	210·26	3,279·46	184·33	7·83	122·31	3·73
6/Oo .	22·97	17·04	10,639	463·17	4,264·35	444·18	19·34	184·14	4·17
6/Ss .	18·77	17·60	13,107	698·29	5,225·92	521·58	27·79	204·01	3·98
6/Tt .	23·01	19·20	12,176½	529·17	4,505·88	523·67	22·76	189·85	4·30
6/Vv	29·30	25·87	17,356	592·35	4,782·39	831·33	28·37	222·52	4·79
6/Xx	27	21·63	12,185	451·30	4,595·14	494·66	18·32	187·43	4·06
6/Ccc	24·53	14·97	6,893½	281·02	2,877·47	300·14	12·24	127·13	4·35
6/Ddd	25·93	19·43	10,079	388·63	3,546·65	438·82	16·92	156·92	4·35
6/Jjj	22·97	21·03	16,224½	706·33	4,511·41	784·30	34·14	214·10	4·83
6/Nnn	35·93	29·27	15,974	444·59	3.865·77	721·59	20·08	170·88	4·52
6/Mmm	7	7	4,695	670·71	4,817·37	212·85	30·41	215·34	4·53
6/Ooo	21·20	19	15,909	750·42	1,471·95	691·63	32·62	61·53	4·35
6/Qqq	15	9	8,250	550·00	—	311·61	20·77	—	3·78
6/Ppp	15	15	16,020	1,068·00	—	667·65	44·51	—	4·17
Means	20·62	16·12	10,349·06	502·00	3,950·18	447·08	21·69	169·62	4·32

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JUNE, 1935.

Herd No.	Average No. of Cows in Herd.	Average No of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow July to June.	Per Herd during June.	Per Cow during June.	Per Cow July to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	10·67	10·67	5,767	540·48	6,159·13	278·17	26·07	294·85	4·82
7/L ..	32	26·47	14,403	450·09	5,860·27	626·24	19·57	259·73	4·35
7/P ..	28·03	19·80	13,789½	491·95	6,664·11	642·73	22·93	317·95	4·66
7/Aa .	25	9·57	5,347	213·88	5,045·89	221·97	8·88	229·31	4·16
7/Tt .	16·53	13·93	10,296½	622·89	7,630·80	433·28	26·21	331·97	4·21
7/Xx	21	17·83	10 965	522·95	6,904·47	563·90	26·92	369·30	5·20
7/Bbb	78·73	63·57	36,885½	468·64	5,922·04	1,730·28	21·98	264·46	4·69
7/Ccc	25	18·40	9,075	363·00	5,572·44	414·84	16·59	239·20	4·57
7/Ddd	12·20	8·83	6,098	499·83	6,609·00	288·02	23·61	316·19	4·72
7/Eee	11·30	10·97	6,964	616·28	6,589·02	359·06	31·77	331·47	5·16
7/Ggg	14·13	9·87	5,011	354·63	4,024·56	225·10	15·93	188·08	4·49
7/Hhh	12	6·30	3,818½	318·21	6,262·61	181·36	10·95	219·14	3·44
7/Iii .	15·77	10·20	6,122½	388·15	6,932·45	226·89	14·39	242·23	3·77
7/Kkk	24·73	17·80	8,727½	352·81	5.201·43	454·04	18·30	262·06	5·11
7/Lll	17	10·93	8,298	488·12	6,463·33	390·63	22·98	340·18	4·71
7/Mmm	12·30	11·33	5,345	434·55	5,364·21	301·72	24·53	281·69	5·64
7/Nnn	12	10·97	6,819½	569·83	1,029·69	279·81	23·89	40·94	4·09
Means	21·67	16·32	9,631·32	444·45	5,784·10	445·18	20·54	265·81	4·62

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JUNE, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow March to June.	Per Herd during June.	Per Cow during June.	Per Cow March to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	29·07	21·47	10,683½	367·51	1,359·65	567·97	19·54	69·34	5·32
9/C ..	13·83	9·30	5,225	377·80	1,644·90	210·95	15·25	68·22	4·04
9/D ..	30·30	25·20	10,501	346·56	1,851·39	577 92	19·07	99·87	5·50
9/E ..	12	8·80	4,242	353·50	1,777·62	207·68	17·31	86 81	4·90
9/F ..	17	10·77	6,565	386·18	1.381·20	266·13	15·65	62·62	4·05
9/G ..	27·87	19·33	9,732½	349·21	1,773·67	519·93	18·66	92·13	5·34
9/I ..	29·57	16·53	9,885	334·29	1,160·16	400·83	13·56	51·04	4·06
9/J...	21	13·40	7,431	353·86	1,169·41	320·37	15·26	49·62	4·31
9/L ..	30	19·50	11,545	384·83	1,207·57	431·68	14·39	47·88	3·74
9/O ..	24·27	18·20	9,417	388·00	1,571·12	459·30	18 92	73·28	4·88
9/P ..	45·50	35·30	23,144	508·65	1,134·15	1,145 03	25·17	57 54	4·95
9/T ..	16·27	11·27	6,183½	380·05	1,211·56	277·20	17·04	54·77	4·48
9/W .	28·97	26·20	17,842	615·87	2,172 20	820·80	28·33	93·34	4·60
9/X .	8·07	5·02	3,228	400·00	1,423·06	169·51	21·00	72·77	5·25
9/Y ..	11	8	4,755	432·27	1,542·01	193 91	17·63	62·03	4·08
9/Z ..	11·53	10·23	3,616	313·61	1,153·34	180·86	15·68	56 54	5·02
9/Aa .	16	15	6,905	431·56	1,584 52	421·10	26 32	90·32	6·10
9/Bb	24·43	17·33	7,953	325·54	963·78	410·05	16·78	49 93	5·16
9/Cc .	18·43	17·30	13,039½	707·51	1,622·54	658·11	35·71	84·64	5·05
9/Ff .	19	5·30	3,626½	190·87	211·91	138·05	7·27	8·01	3·81
9/Ee .	42·63	28·70	11,056½	259·33	675·47	606·29	14·22	35 58	5·48
9/Dd	17	13·57	3,506	206·24	656·21	197·98	11 65	33 85	5·65
Means	22·44	16·17	8,640·09	384·98	1,369·48	417·35	18 60	66·94	4·83

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JUNE, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow October to June.	Per Herd during June.	Per Cow during June.	Per Cow October to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5 C ..	30	25·20	19,628	654·27	4,220·87	1,046·74	34·89	220·01	5·33
5/D ..	33·60	25·50	16,749	498·63	3,877·36	886·15	26 38	208·81	5·27
5/E ..	35·97	22·47	13,917	386·80	4,152·45	761·17	21·15	215 26	5·47
5/R ..	67·70	48·50	37,944½	560·48	3,611·19	1,688·94	24·95	161·89	4·45
5 Ee .	22	3·60	1,123½	51·07	3,805·99	63·82	2·90	194·85	5·68
5/Z ..	29	28·10	25,950	894·83	6,444 11	1,369·50	47 22	328·06	5·28
5/Ww	20	14·93	11,425½	571·28	3,840 30	519·76	25·98	181·15	4·55
5/Xx	20·80	16·60	10,467	503·22	3,701·03	525·92	25·28	194·77	5·02
5/Yy	12	8	4,725	393·75	3,484·66	234·40	19 53	175·51	4·96
5/Aaa	18	11·83	9,068	503·78	3,899·95	443·83	24·66	194·13	4·89
5/Bbb	17·01	5·77	2,887½	169·75	2,847·42	152 58	8·97	143·09	5·28
5/Ddd	28	22·17	18,033	644·03	6,892·78	757·42	27·05	284·84	4·20
5/Eee	23·97	20·47	14,006	584·31	5,568·90	617·33	25·75	250·10	4·41
5/Fff	9			All cows	dry.				
5/Ggg	9	8·63	3,110	345·56	3,986·99	152·13	16 90	187·57	4·89
5/Hhh	19	13·57	6,980½	367·39	5,087·65	298·51	15·71	205·16	4·28
5/Iii	18	14·73	4,830½	268·36	1,298·35	272·23	15·12	76·44	5·64
5/Jjj	26	24	18,675	718·26	2,154·84	973·12	37 43	110·44	5·21
5/Kkk	15·30	15·30	7,050	460·78	1,486·79	324·64	21·22	67·55	4·60
5/Aa .	21	18·90	8,773½	417·78	1,167·28	420 84	20·04	53 16	4·80
Means	23·77	17·41	1,176·77	495·10	4,343·45	575·45	24·21	209·72	4·89

GOYDER'S LINE OF RAINFALL.

[Paper written by the Director of Agriculture (Professor Perkins) in reply to a question submitted at the Ceduna Conference on 3rd July.]

I have been asked to explain "Goyder's Line of Rainfall," and incredible though it may seem, this explanation must throw us back to a period not very far distant from the initial days of the settlement of the State. This settlement, as you know, took place towards the end of 1836: prior to that date the territory now known as South Australia was sparsely occupied by nomadic aboriginal tribes. In the circumstances it is to my mind remarkable that only 29 years later, *i.e.*, in 1865, it should have been possible to place on our maps a continuous line, which subsequently under the name of "Goyder's Line of Rainfall" played a conspicuous part in the history of the development of South Australia.

The memory of a community is proverbially short, and many may ask to-day "who was this Goyder, whose line continued to influence settlement many decades after his death?" According to "Johns' Biographical Dictionary of Australia," George Woodroofe Goyder was born in Liverpool, England, on the 24th of June, 1826; he was the son of Rev. D. G. Goyder, of New Jerusalem Church, London. He reached Australia in 1848, *i.e.*, 12 years after South Australia had been proclaimed a Province; he entered the Government Service in 1851, and occupied the position of Surveyor-General from 1860 to 1894; he led several exploration parties, and fixed and surveyed the site of Port Darwin, which he also laid out. He is said to have surveyed 700,000 acres of farming land in 1869-70. He died at Aldgate on the 2nd of November, 1898.

He appears to have been a man of exceptionally sound judgment and of untiring activity; indeed, in the latter connection he came to be known throughout the country as "little energy." Although in the course of a life-time he did much to facilitate the settlement of South Australia, his chief claim to fame will probably be that invisible Line, which has hitherto served to separate land upon which rural settlement was considered to be safe, on the one hand, from land upon which it was considered to be unsafe on the other. And curiously enough this was very far from having been the original object Goyder had in mind when he set out in 1865 to lay out the line with which his name became indissolubly connected.

In this connection let us hear what he had to say on the subject in his letter of the 6th day of December, 1865, addressed to the Secretary of Crown Lands, and submitted subsequently to the House of Assembly and ordered to be printed by that body on 12th December, 1865:—

SURVEYOR-GENERAL'S REPORT ON DEMARCATION OF NORTHERN RAINFALL.

Ordered by the House of Assembly to be printed, 12th December, 1865.

Surveyor-General's Office,
6th December, 1865.

Sir—I have the honour to report, for the information of the Honourable the Commissioner, that agreeably to instructions contained in your letter of the 3rd ultimo, I proceeded to make the necessary examination of the country lying to the north of Adelaide, to enable me to determine and lay down on the map, as nearly as practicable, the line of demarcation between that portion of the country where the rainfall has extended, and that where the drought prevails.

Had the drought, which unfortunately still prevails, been that of an ordinary nature, there had been no necessity for my leaving town upon this duty, as the line of demarcation might have been shown from information previously in my possession, and specially referred to in my report on the valuation of some of the northern runs. The drought, however, being of an unusually severe nature, and extending more generally than any previously known, it became indispensable to add to my previous experience the knowledge of the state of the country as it now exists. To obtain this information, I adopted the following general route:—Passing in various directions over the intermediate country—viz., from Adelaide north-easterly to the Murray, northerly and north-westerly to Kooringa, north to Gottlieb's Wells,(1) east to Ketchoula,(2) northerly to Teetulpa,(3) southerly to east of Mount Lock,(4) north-west by Boniah Creek,(5) Rocky Gully,(6) and Hogshead(7) to Pekina, south-west and north-west through Booleroo to Mount Remarkable, north-easterly over plain to north of Kanyaka Run,(8) south-westerly by Western Plains to Port Augusta, and by Baroota and Telowie to Crystal Brook and Broughton, and thence by Clare to town.

The result of my investigation shows the line of demarcation extending considerably further south than I anticipated. The change from the country suffering from excessive drought to that where its effect has only been slightly experienced being palpable to the eye from the nature of the country itself, and may be described as bare ground, destitute of grass and herbage, the surface soil dried by the intense heat, in places broken and pulverised by the passage of stock, and formed by the action of the wind into miniature hummocks, surrounding the closely cropped stumps of salt, blue, and other dwarf bushes, whilst those of greater elevation are denuded of their leaves and smaller branches as far as the stock can reach. This description generally holds good of all country upon which stock has been depastured and where the drought obtains. The change from that to where the drought has had a less serious effect being shown by the fresher and more leafy appearance of the bushes, gradually improving to those in their ordinary state, and the gradual increase of other vegetation from bare ground to well-grassed country.

During my visit I observed that places upon stocked runs pretty well grassed during the drought of 1859 are now utterly destitute of grass or herbage.

The line of demarcation I found to extend from Swan Reach, on the River Murray, in a south-north-westerly direction to the Burra Hill,(9) and thence north to Oak Rises, east of Ulooloo,(10) and by the last-named hill to Mount Sly; and in a northerly and westerly direction as shown by plan herewith forwarded, by the Hogshead and Tarcowie, to Mount Remarkable; thence southerly by the Bluff and Ferguson's Range to the Broughton; and south-westerly to the east shore of Spencer's Gulf, crossing the Gulf to Franklin Harbour; and thence north-westerly to the west end of the Gawler Ranges.

Should the Commissioner wish for any further information on this subject, or desire suggestions as to the mode of meeting the distress caused by this sad visitation, which my knowledge of the subject and experience may enable me to offer, I shall be happy to supply such additional information as may be required.

I have, &c.,

(Signed) G. W. GOYDER, Surveyor-General.

To the Secretary of Crown Lands.

(1) Gottleib's Wells changed to Parnggi Wells: 2 miles South-west of Terowie.
(2) Ketchoula: 19 miles South-east of Terowie.
(3) Teetulpa: Goldfield 22 miles North-east of Yunta on Cockburn Railway line.
(4) Mount Lock: 11½ miles South-west of Yongala.
(5) Boniah Creek: 5 miles North-west of Yongala.
(6) Rocky Gully: Between Boniah Creek and Hogshead.
(7) Hogshead: 5 miles North of Tarcowie.
(8) Kanyaka Run: 3½ miles North-west of Gordon and 14 miles South-west of Hawker.
(9) Burra Hills: 10 miles South-east of Kooringa.
(10) Ulooloo: 9 miles south of Yarcowie.

It will be seen from this letter that Goyder's immediate object was to separate pastoral areas that had suffered from the effects of drought from those that had not so suffered: at the time cultivation does not appear to have extended much beyond Clare, and recognised farming areas were therefore well within good rainfall conditions; and it is only in later times that "Goyder's Line" came to be looked upon as the boundary beyond which cultivation should not extend.

In order to stress economic and climatic conditions of 1864-65 and 1865-66 in contrast with those more familiar to us, I have summarised a few data in Table I.

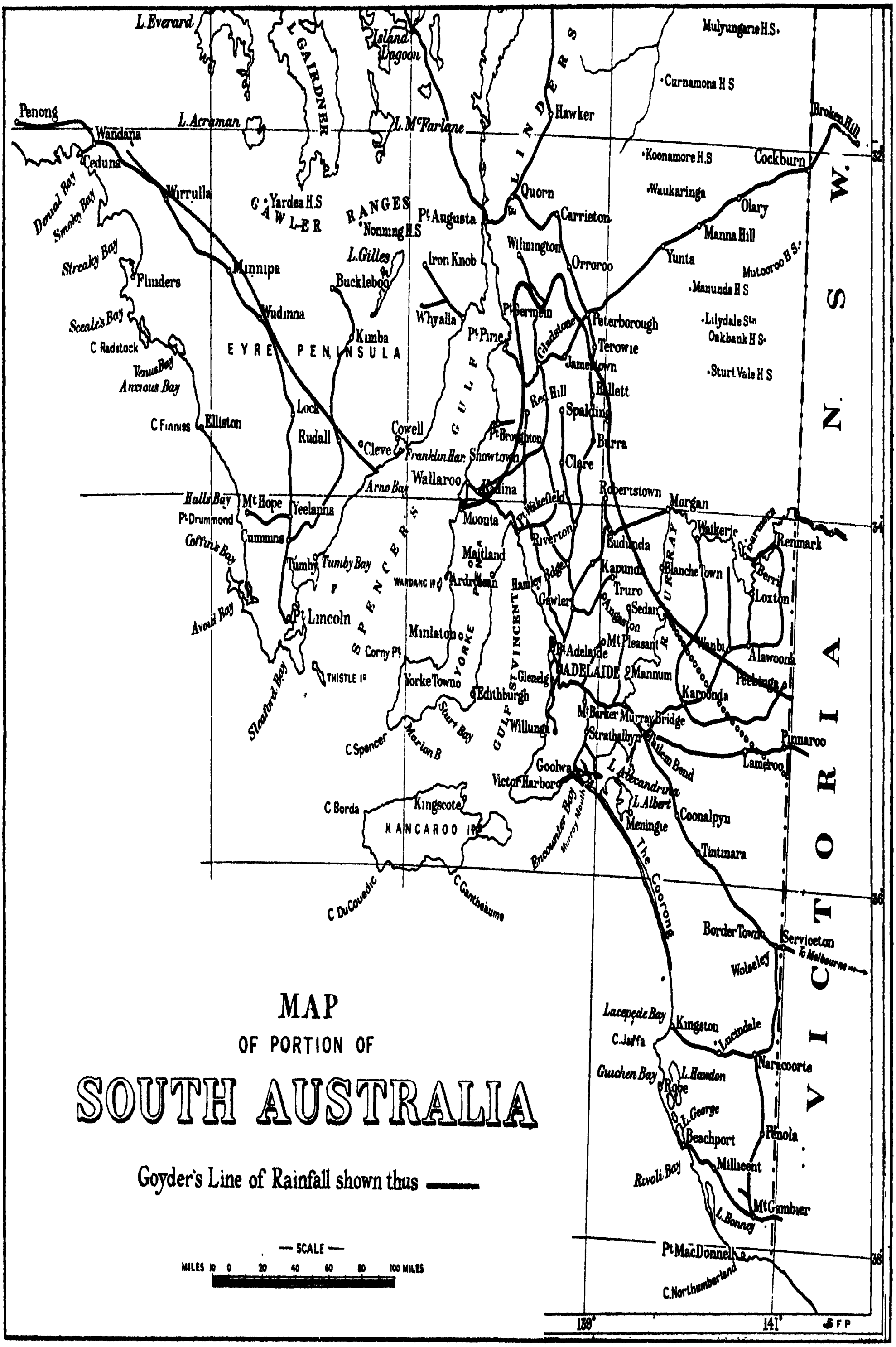
TABLE I.—*Comparative Statistical Data.*

		Means of 1864-65 and 1865-66.		1933-34.	
		Total.	Per Head.	Total.	Per Head.
Population	Nos.	157,426	—	583,538	—
Under Cultivation	Acres	624,172	3·96	7,852,369	13·46
Under Wheat	Acres	400,722	2·55	3,821,795	6·55
Wheat Production	Bush.	3,920,375	24·90	35,373,466	60·62
Mean Yield per Acre	Bush.	9·78	—	9·26	—
Mean price per bushel	s. d.	7 6	—	2 7½	—
Mean April-November Rain	Ins.	15·91	—	11·58	—
Bare Fallow	Acres	102,407	0·65	2,545,324	4·36
Horses	Nos.	68,446	0·43	196,789	0·34
Cattle	Nos.	181,475	1·15	352,728	0·60
Sheep	Nos.	3,942,769	25·05	7,941,960	13·61
Pigs	Nos.	54,586	0·35	91,573	0·16
Government Revenue	£	932.484	5 18 6	10,187,986	17 9 10
Government Expenditure	£	663,596	4 4 4	12,712,166	21 16 7
Public Debt	£	817,750	5 3 11	106,682,092	182 17 10
Railways Open	Miles	68	—	2,530	—
Main Roads	Miles	276	—	—	—
Wool exports	Lbs.	16,180,993	100·45	58,539,161	100·33
Wool exports (Value)	£	798,569	5 1 5	3,799,000	6 10 2
Wheat exports	Bush.	1,282,424	8·15	—	—
Wheat exports (Value)	£	487,905	3 2 0	3,038,240	52 1 4

An examination of the above Table will show that, whilst relatively to the position of our predecessors of 1865 we certainly have made some progress, we appear to have fallen back in others. In the course of 70-odd years our population has nearly quadrupled at the mean rate of about 6,000 head per annum: more spectacular still has been the rise of our National Debt, namely from £817,750, and £5 3s. 11d. per head to £106,682,092, and £182 17s. 10d. per head: that is to say an increase of £105,864,382, or at a mean rate of more than one and a half million sterling per annum. True we have something to show for this huge debt: nearly 8 million acres in cultivation instead of about 650 thousand acres; two and a half million acres under Bare Fallow instead of one hundred thousand; thirty-five million bushels of Wheat instead of four million bushels, but 9.26 Bushels per acre only with superphosphate against 9.78 Bushels per acre without superphosphate; Government Revenue and Expenditure of ten and thirteen million sterling respectively against corresponding figures of nine and seven hundred thousand; two thousand five hundred miles of railroad against sixty-eight miles; and so on.

But our main concern is "Goyder's Line" to which facts such as these must serve as a background. It must, however, be clear that the causal factor behind the line was what was considered at the time as two successive years of unparalleled drought in the pastoral country. The following extracts from authoritative sources will serve to show what was thought of the drought in those days.

Supplement to the *Journal of Agriculture*, South Australia.]



MAP
OF PORTION OF
SOUTH AUSTRALIA

Goyder's Line of Rainfall shown thus ▬▬

— SCALE —

MILES 10 0 20 40 60 80 100 MILES

I shall give one example of the results before passing over to the mainland: for the purpose I shall take County Dufferin: data given below have reference to the four Hundreds that are substantially beyond Goyder's Line:—

Mean Wheat Yields for the Ten-year Period Ending in 1932.

Hundreds.	Mean Areas.	Mean Yields per Acre.
	Acres.	Bushels.
Hague	2,693	5·34
Nunnyah	1,898	6·90
Wallala	8,968	5·09
Koolgera	2,546	4·48
Mean of Four Hundreds	16,105	5·25

For that portion of County Dufferin which is situated outside Goyder's Line the mean yield of the past 10 years—5.25bush. per acre—does not appear to have justified the extension of farming beyond the Line: a possible exception might be the Hundred of Nunnyah with a mean yield of 6.90bush.

Before leaving Eyre's Peninsula it is as well to recall that for a variety of reasons vast areas brought under Wheat have not yet been adequately farmed: and it is certain that to an appreciable extent defective farming methods must be accepted as one of the factors responsible for undesirably low yields beyond the Line.

On the mainland there are eight Counties placed outside Goyder's Line in which Wheatgrowing has been carried on for many years: and if, including County Albert by far the greater proportion of which is outside the Line, the number would be raised to nine. Full data concerning these nine Counties are shown in tabular form on next page.

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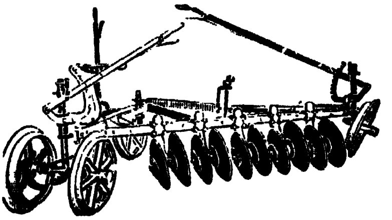

10 Disc, cuts 5ft.

14 Disc, cuts 7ft.

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TABLE II.—*Showing Mean Yields Per Acre of Wheat Grown in Nine Counties Outside Goyder's Line* (1906-1933).

	Units.	1906-16, 10 years.	1916-26, 10 years.	1926-33, 7 years.	1906-33, 27 years.
UPPER NORTH DIVISION.					
County Hanson—					
Mean area sown	Acres.	20,359	12,267	13,653	15,263
Mean yield per acre	Bush.	4·16	7·96	4·33	5·30
County Blatchford—					
Mean area sown	Acres.	8,363	5,875	8,102	7,370
Mean yield per acre	Bush.	4·73	8·51	5·74	6·13
County Newcastle—					
Mean area sown	Acres.	23,059	16,282	26,272	21,382
Mean yield per acre	Bush.	5·88	9·95	4·57	6·61
County Granville—					
Mean area sown	Acres.	15,059	5,031	6,224	9,075
Mean yield per acre	Bush.	4·22	9·05	3·90	5·16
County Herbert—					
Mean area sown	Acres.	8,322	4,328	4,168	5,766
Mean yield per acre	Bush.	6·33	9·15	4·89	6·84
LOWER NORTH DIVISION.					
County Kimberley—					
Mean area sown	Acres.	16,063	8,734	10,942	12,006
Mean yield per acre	Bush.	6·76	11·34	5·74	7·75
MURRAY MALLEE DIVISION.					
County Albert—					
Mean area sown	Acres.	69,541	113,801	229,811	127,452
Mean yield per acre	Bush.	6·61	7·08	4·82	5·93
County Alfred—					
Mean area sown	Acres.	50,748	143,972	273,096	142,921
Mean yield per acre	Bush.	8·41	9·51	6·15	7·69
County Young—					
Mean area sown	Acres.	5,594	6,622	13,835	8,037
Mean yield per acre	Bush.	5·20	6·33	4·74	5·34

On the mainland it cannot be said that Counties such as Hanson, Granville, and Young, the means yields per acre of which did not during 27 successive seasons exceed 5bush. by much, have justified themselves as Wheatgrowing Counties: it would probably be better for all concerned if they were allowed to revert wholly to sheep. Nor are the Counties Blackford, Newcastle, Herbert, and Albert, with mean averages over the same period varying from 5.93 to 6.84bush. per acre, very much better off. And it would seem that two only of the Counties outside Goyder's Line are worth retaining for Wheatgrowing purposes, namely:—

	1906-16, 10 years.	1916-26, 10 years.	1926-33, 7 years.	1906-33, 27 years.
	Bushels.	Bushels.	Bushels.	Bushels.
Kimberley	6·76	11·34	5·74	7·75
Alfred	8·41	7·51	6·15	7·69

And even in these two Counties Wheatgrowing alone is likely to prove a heavy struggle for those concerned.

It would seem to follow therefore that on the whole it would have been better for all if we had recognised in Goyder's Pastoral Line the limits beyond which Wheat could not be grown to economic advantage. But this could not have been: we had a vast territory open for settlement, and it was inevitable that we should test its possibilities to the utmost limits. The trouble is, however, that having discovered the limitations of this territory we are still exceedingly loath to recognise the latter in practical manner.

ENSILAGE COMPETITIONS.

HILLS DISTRICT.

[Judged by ROWLAND HILL, District Agricultural Instructor.]

Unfortunately the entries, comprising thirteen in number, were considerably below that of last year. Three of that number had not been opened for use when the time had expired, which left only ten actually judged.

However, the majority of those judged were very satisfactory, and should be a helpful advertisement in increasing the quantity made in these districts in the future.

The storing of fodder in the form of Silage is simple, economic, and the only means of conserving feed for livestock whereby succulency and valuable laxative qualities can be retained.

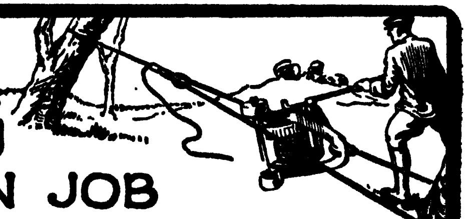
Repeated success by farmers who have taken reasonable care in the manufacture of silage should leave no doubt in the minds of those who have not attempted it, and the Department of Agriculture can at any time give advice where required.

Special mention should be made of the excellent quality of the Silage in the three leading entries, and particularly that nominated by Mr. D. F. Sheppard, of Prospect Hill, who is a firm believer in the use of Silage for his dairy cows, which, in themselves are a splendid recommendation to other livestock owners who have not yet realised the value of Silage.

As can be seen from the analyses, the nutritive value of the fodder is very satisfactory, and in the majority of cases some of the inferior types of grasses and other material have been included in the mixture, which demonstrates how material, otherwise not appreciated by livestock, can be converted into a palatable and valuable fodder.

Although faults in curing could be found in many entries, the owners realised that they existed, and the trouble could be traced to circumstances which could not be avoided at the time.

Generally, the improvement in the quality of Silage was pleasing, and the increased popularity of it as a fodder was very evident.



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Results of Competition.

Position.	Competitor.	Suitability of Plants. 15.	Succulency. 20.	Palatability. 15.	Nutritive Value. 35.	Percentage of Waste. 15.	Total. 100.
1	D. F. Sheppard	13	19	14	33	13	92
2	J. M. Irwin............	14	19	14	30	12·5	89·5
3	R. G. Magor	14	18	14	29	13·5	88·5
4	R. J. Clements.........	12	18	14	26	14·5	84·5
4	H. F. Ouston	13	16	14	28	13·5	84·5
6	H. A. Woolley	14	18	12	27	13	84
7	A. E. Francis	13	18	13	27	12	83
8	F. P. Smith	12	14	12	29	13·5	80·5
9	M. J. Meyer	13	14	13	26	12	78
10	J. H. Dawkins	11	16	11	26	13	77

Analyses Standardised to 75 per cent. Moisture.

Position.	Competitor.	Moisture.	Fat.	Fibre.	Ash.	Protein.	Carbohydrates	Total.
		%	%	%	%	%	%	%
1	D. F. Sheppard ...	75	1·450	5·850	2·425	4·725	10·550	100
2	J. M. Irwin........	75	1·35	7·175	2·450	3·275	10·750	100
3	R. G. Magor	75	·82	7·430	2·075	3·575	11·100	100
4	R. J. Clements.....	75	·70	9·050	2·300	2·200	10·750	100
4	H. F. Ouston	75	·75	7·075	2·625	4 200	10·350	100
6	H. A. Woolley	75	·875	8·750	2·375	3·925	9·075	100
7	A. E. Francis	75	·75	9·025	1·900	3·150	10·175	100
8	F. P. Smith	75	·95	7·350	2·525	3·375	10·800	100
9	M. J. Meyer	75	·70	8·050	2·700	3·625	9·925	100
10	J. H. Dawkins	75	·475	8·950	2·050	2·275	11·250	100

JUDGE'S COMMENTS ON THE WINNING ENTRY OF Mr. D. F. SHEPPARD.

D. F. SHEPPARD (Prospect Hill).—A stack 12ft. by 12ft. which had been well weighted with stones. The material consisted of a high percentage of Subterranean Clover, mixed with Cape Weed, Soft Brome Grass, Sterile Brome Grass, Perennial Rye Grass, and Silver Grass. The stack was built in seven days, and contained exceptionally well-cured Silage, with only a small percentage of waste on the outsides. The condition of the livestock being fed from the stack was sufficient evidence of its palatability and nutritive value.

SOUTH-EASTERN DISTRICT.

CONDUCTED BY SOUTH AUSTRALIAN COMMITTEE OF AUSTRALIAN DAIRY COUNCIL.

[Judged by E. S. ALCOCK, District Agricultural Instructor.]

In the course of his report in the Competition, Mr. Alcock said most of the competitors had not had any previous experience in the manufacture of ensilage, but the success which attended their efforts was so encouraging that they propose continuing with this method of storing fodder. The entries were received from a wide area ranging from Coonawarra in the north, Rendlesham in the west and Kongorong in the south. The lack of confidence regarding success in the manufacture of ensilage is gradually disappearing, and there is no doubt that in the near future it will be a regular operation throughout the pasture areas. An example of the advantage of ensilage over grass hay was illustrated this year when several stacks of the former were partially erected and heavy rain fell. No damage was done to the ensilage, but considerable trouble was experienced in drying the grass hay and it also lost quite a good deal of food value.

There was considerable variation in the moisture content and in order that a fair comparison could be made, all entries reduced to a common basis of 75 per cent. moisture.

In the following table the results after making this calculation and also ascertaining the starch equivalents and nutritive ratios are shown:—

Table Showing Particulars of Samples Reduced to 75 per cent. Moisture.

	Moisture.	Ash.	Protein.	Fat.	Fibre.	Carbo-Hydrates.	Total.	Starch Equivalent.	Nutrient Ratio.
	%	%	%	%	%	%	%	%	
A. P. Spehr	75	2·5	4·4	0·7	7·4	10·0	100	11·75	1 to 4·2
E. F. Gaffney	75	2·7	4·5	1·1	6·7	10·0	100	12·07	1 to 4·2
R. E. R. Lear	75	2·0	3·6	1·2	7·7	10·5	100	12·13	1 to 5·5
A. H. Allen	75	2·9	4·3	0·8	7·5	9·5	100	11·73	1 to 4·3
F. C. Caine	75	2·4	3·8	0·8	7·1	10·9	100	12·01	1 to 5·0
R. Smith	75	3·5	3·4	0·9	7·9	9 3	100	11·19	1 to 5·5
A. G. Stringer	75	2·6	2·4	0 7	8·0	11·3	100	11·44	1 to 8·4
F. A. Aslin	75	2·5	2·9	0·7	8·7	10·2	100	11·19	1 to 7·0
G. L. Dean	75	2·6	3·1	0·7	6·4	12·2	100	11·98	1 to 6·4
W. K. Chambers ...	75	2·7	2 7	0·8	8·9	9·9	100	10·50	1 to 7·4
Mrs. G. D. Stuckey	75	2·5	2·2	0·3	8·0	12·0	100	10·68	1 to 9·5

AWARDS.

The eleven entries were considered from the point of view of the suitability of the plants, succulence, palatability, and nutritive value of the material, together with the loss sustained in manufacture.

The points awarded under these headings and the relative position of each competitor are shown in the following table:—

Competitor.	Address.	Position.	Suitability. of Plants 15	Succulence. 20	Palatability. 15	Nutritive Value. 35	Percentage of Waste. 15	Total. 100
A. P. Spehr	O. B. Flat.......	1	14	16	13	33	14	90
E. L. Gaffney...	Coonawarra	2	13	15	13	34	14	89
R. E. R. Lear ..	Coonawarra	3	12	15	14	33	14	88
A. H. Allen	Wandilo	3	12	19	13	32	12	88
F. C. Caine	Kongorong	5	14	13	14	33	13	87
R. Smith.......	Mount Gambier	6	10	19	14	31	12	86
A. G. Stringer ..	Mount Schank ..	7	13	13	12	30	12	80
F. A. Aslin	Mount Gambier	7	12	15	12	30	11	80
G. L. Dean	Kalangadoo	9	13	12	10	31	12	78
W. K. Chambers	Mil Lel	9	13	14	13	26	12	78
Mrs. G. D. Stuckey	Rendlesham	11	11	12	11	27	11	72

Commenting on the winning entry of Mr. A. P. Spehr, Mr. Alcock said this was stacked in a stone shed, 75ft. long, 15ft. wide, and about 20ft. high, and well weighted down with fencing posts, &c. An excellent exhibit with which a good deal of care was taken. The silage consisted of Perennial Rye Grass, Burr Clover, and Mount Schank Clover, making a good silage mixture. The green stuff was cut early in the season before it became too far advanced. The ensilage had an excellent aroma, and was readily eaten by stock. An odd load of material which had been left cut too long in the field was noticed. Waste was reduced to a minimum, and then only occurred alongside the wall.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

RIVER MURRAY PRUNING COMPETITIONS.

The River Murray Pruning Competitions held this year were once again successful, and at each district—Mypolonga, Berri, Barmera, Moorook, Cadell, and Waikerie—special interest was shown, one pleasing feature being the number of junior competitors. In 1933 Mr. W. Langdon Parsons donated a silver cup for competition between districts, the ultimate winner to be the most consistent pruner over three years. The winner in 1933 was E. A. Liddicoat, Moorook, 548 points; 1934, H. M. Perkins, Berri, 539 points; 1935, C. Curtis, Waikerie, 549 points. The most consistent over the period was C. Curtis with 1,618 points, closely followed by H. M. Perkins, 1,615; A. Wedd, Mypolonga, 1,613; with E. A. Liddicoat and W. E. Rout, Berri, each 1,612.

The championship was held at Moorook and 15 competitors took part. Mr. J. B. Murdoch attended on behalf of the Advisory Board of Agriculture and the judging was done by Mr. E. Leishman (Horticultural Instructor) and Messrs. F. J. Elliott and R. N. Quinn (District Horticultural Instructor), Consultative Judges. The pruning was, as it should be, very good, only three points separating the top five competitors in the aggregate. The results were:—Vines—1st, H. M. Perkins, Berri, 283 points; 2nd, E. A. Liddicoat, Moorook, 282 points; 3rd, S. Loxton, Moorook, 281 points. Trees—1st, A. Wedd, Mypolonga, 266 points; 2nd, G. Elliott, Waikerie, W. H. Harris, Berri, 260 points.

The aggregate trophy, valued three guineas, was presented by the Dried Fruits Board, and the winner was W. H. Harris, of Berri, with 538 points. The other trophies were two cups donated by the Royal Agricultural and Horticultural Society for vines and trees respectively, and valuable manure trophies from Wallaroo-Mount Lyell Fertilisers and Adelaide Chemical and Fertiliser Company. The donors of these various trophies have been staunch supporters of the competitions, and the committee appreciates their valuable assistance, which has added to the interest of the pruning.

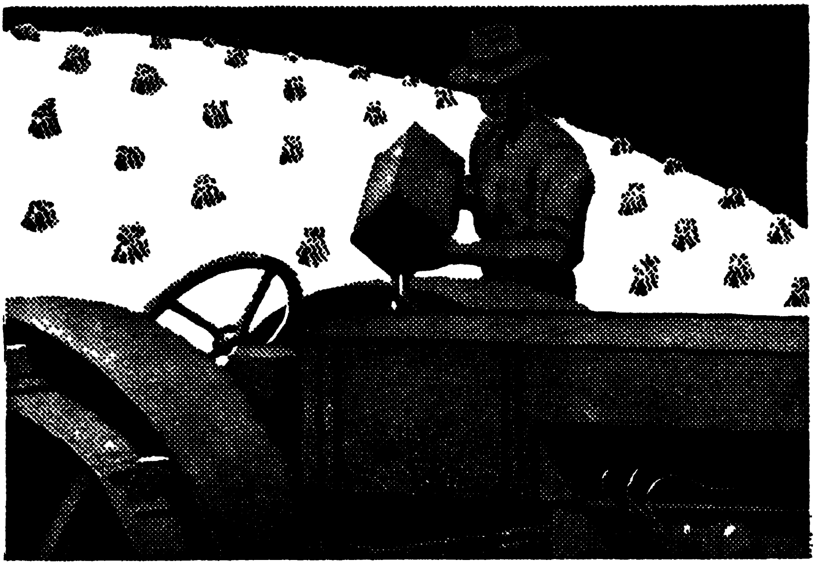
The following are the detailed figures of the Championship Competition:—

VINE SECTION.

Competitor. Branch.	Gordo.	Currant.	Sultana.	Total.
H. M. Perkins (Berri)	87	90	106	283
E. A. Liddicoat (Moorook)	87	90	105	282
S. Loxton (Moorook)	88	91	102	281
C. Curtis (Waikerie)	90	89	99	278
W. H. Harris (Berri)	87	86	105	278
G. Elliott (Waikerie)	87	85	103	275
R. Loxton (Moorook)	85	89	100	274
C. Kruger (Mypolonga)	85	85	102	272
W. E. Rout (Berri)	87	86	98	271
W. Perry (Waikerie)	87	87	96	270
A. E. Wedd (Mypolonga)	87	82	100	269
E. Prosser (Mypolonga)	83	87	95	265
W. Penny (Barmera)	86	83	95	264
A. E. Simpson (Barmera)	80	83	95	258
K. Shepherd (Barmera)	80	81	94	255

TREE SECTION.

Competitor. Branch.	Apricot.	Peach	Pear.	Total.
A. E. Wedd (Mypolonga)	90	89	87	266
W. H. Harris (Berri)	88	82	90	260
G. Elliott (Waikerie)	88	84	88	260
W. E. Rout (Berri)	87	86	85	258
A. C. Boehm (Waikerie)	84	85	89	258
S. Sanders (Moorook)	84	88	83	255
E. Prosser (Mypolonga)	86	87	82	255
E. A. Liddicoat (Moorook)	87	82	84	253
H. M. Perkins (Berri)	86	86	81	253
C. Kruger (Mypolonga)	82	87	84	253
C. Curtis (Waikerie)	82	84	86	252
F. Battams (Moorook)	83	85	83	251



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LANGDON PARSONS TROPHY.

Mr. J. J. Odgers, General Secretary of the Competition, announced the winner of the W. Langdon Parsons trophy as C. Curtis, of Waikerie. The winner gained 1,618 points, and was closely followed by H. M. Perkins 1,615, A. E. Wedd 1,613, E. A. Liddicoat 1,612, G. Elliott 1,608, W. Perry 1,596, C. Boehm 1,584.

NEXT CHAMPIONSHIP AT MYPOLONGA.

It was unanimously decided to recommend to Conference that the next Championship meeting be held at Mypolonga. It was stated that the championships had never been held in that centre, but that pruners from there had been coming to Upper Murray Competitions for many years.

LOWER NORTH.

The Championship of the Lower North Pruning Competitions was held at Williamstown on July 17th. Orchards and vineyards were kindly placed at the disposal of the committee by Messrs. W. C. Smith, A. J. Mitchell, G. L. Leditschke, and C. Fromm. Results:—

VINE SECTION.

Judges—Messrs. J. L. Williams (Viticultural Instructor, Roseworthy Agricultural College), and E. Leishman (District Horticultural Instructor).

Abbreviations.—Branches: (Li. Ps.), Light's Pass; (Lo.Pi.), Lone Pine; (W.), Watervale; (Wms.), Williamstown; (LD.), Lyndoch; (K.), Koonunga; (P.), Penwortham; (G.), Greenock.

Competitor.	Bush Vines. Spur-Pruned. 100	Trellis Vines. Rod and Spur-Pruned. 100	Total. 200
A. T. Leske (Wms.)	93	97	190
H. Linton (Li. Ps.)	93½	95	188½
H. Parbs (Lo. Pi.)	94½	93	187½
G. Merritt (W.)	96	91	187
P. Obst (G.)	94	93	187
F. Linton (LD.)	90½	95½	186
F. L. Chapman (Wms.)	93	92	185
A. Hentschke (Lo. Pi.)	91	91½	182½
H. Falkenberg (K.)	90½	92	182½
A. Obst (G.)	93	88½	181½
H. O. Helbig (G.)	90½	90	180½
R. Schulz (K.)	86½	93½	180
A. Linton (LD.)	89	89½	178½
W. Ahrens (Li. Ps.)	88	90	178
R. Gallasch (K.)	88½	88	176½
W. O. Baker (W.)	91½	84	175½
H. Kappler (Lo. Pi.)	90½	83	173½
W. B. Koop (Li. Ps.)	87	83½	170½
B. O. Sachse (W.)	88	81	169
F. Nayda (P.)	85½	81	166½
C. S. Wyman (P.)	85½	80	165½
H. Obst (Wms.)	80½	84½	165
R. Dahlitz (LD.)	80½	80½	161
F. Ward (P.)	82	78	160

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7, Murray Street, HOBART, Tasmania.

Messrs. Field & Co. Pty. Ltd.,
46, Esplanade,
DEVONPORT, Tas.

Mr. A. Heath, Manager,
N.W. Mercantile & Agency Co.,
Esplanade, DEVONPORT, Tas.

Messrs. W. Hart & Sons Pty. Ltd.,
Charles Street,
LAUNCESTON, Tas.

Messrs. Davidson & French Pty. Ltd., 37 St. John Street, LAUNCESTON, Tasmania.

TREE SECTION.

Judge—H. H. Orchard (District Horticultual Instructor)

Competitor.	Prune. M. 100.	Pear. M. 100.	Peach. M. 100.	Apricot. M. 100.	Total. M. 400.
F. Boehm (Li. Ps.)	95½	90½	94½	88½	369
C. A. Hoffman (Lo. Pi.)	93½	91	92	90	366½
J. B. Helbig (G.)	94½	90	92	90	366½
C. F. Wilksch (G.)	91	87½	95	91	364½
V. M. Duke (P.)	93	89	89½	93	364½
A. Smith (W.)	90	90	92	91½	363½
E. G. Helbig (G.)	91	89½	89½	91	361
H. Linton (Li. Ps.)	91½	88	91	90	360½
G. Boehm (Li. Ps.)	87½	92	87½	92½	359½
H. D. Bain (Wms.)	89	91	90½	88½	359
A. T. Leske (Wms.)	91½	89	88	90½	359
A. Andriske (Lo. Pi.)	90½	87	91	90	358½
H. Kappler (Lo. Pi.)	94	87	86½	90½	358
J. Alcock (Pi)	89½	88½	88	91½	357½
W. O. Baker (W.)	87	88	91½	90½	357
W. H. Penna (P.)	87½	89½	89½	89	355½
D. J. Bain (Wms.)	78	89½	91½	94	353
E. W. Burgess (W.)	90½	87½	77½	90½	346

THE W. LANGDON PARSON'S TROPHY.

Two Years' Aggregate Figures.

In six sections each year; maximum 1,200 points, from local Competition results. Competitors who have gained more than 1,000 points:—

G. Boehm	1,087	W. Koop	1,051
J. B. Helbig	1,082	W. Ahrens	1,050
C. A. Hoffman	1,082	W. O. Baker	1,047
E. G. Helbig	1,079	A. S. Burgess	1,043
H. Linton	1,076	A. Smith	1,036½
C. F. Wilksch	1,070½	K. Boehm	1,036
A. Andriske	1,065½	A. B. Fromm	1,032
F. Boehm	1,064	E. Kruger	1,031½
A. Kappler	1,061	O. T. Burford	1,025
A. T. Leske	1,058½	E. W. Burgess	1,023½
E. Boehm	1,054	D. Boehm	1,018½
S. M. Turnbull	1,053	R. H. Burgess	1,004½

STATE OF SOUTH AUSTRALIA.

SUMMARY OF LIVESTOCK STATISTICS, YEAR 1934.

[A. W. BOWDEN, Acting Government Statist.]

I. SHEEP AND WOOL.

1. *Number of Sheep.*—The sheep flocks on 31st December, 1934, numbered 7,884,919, a decrease of 56,141 on the record of 7,941,060 in 1933. The flocks were classified as follows:—Ewes, 4,199,530 (4,073,611); wethers, 2,091,575 (2,079,515); rams, 104,437 (100,169); under 1 year old, 1,489,377 (1,687,765).

2. *Breeds of Sheep* were reported by owners as follows:—Merino, 6,792,155; Corriedale, 76,303; Dorset Horn, 7,201, Leicester Border, 3,554; Leicester English, 1,225; Lincoln, 1,288; Polwarth, 1,639; Ryeland, 1,109; Romney Marsh, 3,388; Shropshire, 3,341; Southdown, 2,202; Suffolk, 3,069; pure breeds (not stated), 844; Merino Comeback, 486,498; all other (including Crossbred), 501,103; total, 7,884,919.

3. *Lambing,* 1934.—During 1934 3,408,561 (3,304,532) ewes were mated and 1,875,296 (2,051,130) lambs marked; percentage, 55.02 (62.07).

4. *Winter Lambing,* 1935.—3,520,000 ewes were reported as either mated or intended to be mated for the winter lambing of 1935. In addition 140,000 ewes were expected to be reserved for spring lambing. Details for the 1935 winter lambing are being obtained, and will be published later.

5. *Wool Clip.*—8,131,202 (8,111,296) sheep and lambs were shorn; the total clip, including locks, bellies, pieces, &c., being 68,547,294lbs. (67,668,282lbs.), increase 879,012lbs., which is the highest clip on record. The average fleece for sheep and lambs combined was 8.43lbs. (8.34lbs.), and for sheep only 9.66lbs. (9.81lbs.).

6. *Total Wool Production.*—Subject to slight revision, it is estimated that the grand total wool production, including the clip and wool fellmongered and wool on local skins exported, was 77,500,000lbs. (79,288,903lbs.); increase, 1,788,903lbs.; value, £2,650,000 (£4,506,253); decrease, £1,856,253, the average value per lb. greasy being 8.19d. (13,64d.).

II. Cattle.

1. *Numbers.*—All kinds, 346,479 (352,728); decrease, 6,249. Dairying cattle, 170,250 (163,875); increase, 6,375, classified as follows:—In milk, 113,811 (110,551); dry, 40,198 (36,930); and heifers springing, 16,241 (16,394). In addition there were 22,878 (22,211) other heifers 1 year and over which are possible additions to the dairying herds. The dairy cattle number exceeded the record of the previous year.

2. *Butter and Cheese.*—Provisional 1934-35 butter, 18,250,000lbs. (19,755,695lbs.), and cheese, 6,700,000lbs. (5,316,971lbs.). Oversea exports were:—Butter, 6,299,175lbs. (8,308,420lbs.); cheese, 2,359,107lbs. (667,172lbs.). Cheese production exceeded the previous record by approximately 600,000lbs., and the oversea exports by nearly 800,000lbs.

III. Horses.

Horses, 198,765 (196,789); increase, 1,976, being highest since 1928.

IV. Pigs.

Pigs, 86,297 (91,573); decrease, 5,276.

V. Goyder's Line of Rainfall and Livestock.

During the year 1934 the percentage to the total of sheep outside Goyder's Line of Rainfall decreased from 34.30 to 32.65, cattle 29.30 to 27.63, and horses 27.59 to 26.95. The numbers within and without the line for 1934 were:—Sheep, 5,310,764 and 2,574,155; cattle, 250,738 and 95,741; horses, 145,199 and 53,566.

VI.—Interstate Movement of Stock.

The State gained 28,573 head of cattle, 81,303 sheep, and 433 horses by transit of stock between States. The total imports were:—Sheep 211,785, cattle 40,639, horses, 1,804; and exports—Sheep 130,482, cattle 12,066, horses 1,371. Net exports of horses to oversea countries, 254.

VII. Slaughtering.

Sheep and lambs, 1,591,054 (1,495,127); cattle, 140,170 (104,488); pigs, 150,575 (167,526). Oversea exports, 1934-35, were:—273,680 (206,144) carcasses of lamb, 3,493 (10,391) carcasses of mutton, 1,035,066lbs. (746,884lbs.) of pork, 473,666lbs. (4,708lbs.) of beef, and 93,179lbs. (———lbs.) of veal.

VIII. Value of Pastoral and Dairying Industries.

Provisional for 1934-35, £5,430,000 (£6,857,996); decrease, £1,427,996.

LIVESTOCK AS AT 31ST DECEMBER, 1934 IN COMPARISON WITH 31ST DECEMBER, 1933.

Division.	Sheep.		Cattle.		Horses, 1933-1934.	Pigs, 1934-1934.
	1934.	1933.	1934.	1933.		
	No.	No.	No.	No.	No.	No.
Central	1,611,019	1,615,925	124,492	129,658	59,933	41,912
Lower North	1,186,941	1,262,400	41,777	41,404	40,941	15,575
Upper North	853,766	961,604	23,065	24,669	14,147	3,775
South-Eastern	1,513,112	1,433,809	55,976	50,280	12,443	4,577
Western	1,214,224	1,129,085	19,000	17,367	28,276	8,475
Murray Mallee	616,758	609,750	34,884	36,378	31,739	11,830
Total counties	6,995,820	7,012,573	299,194	299,756	187,479	86,144
Outside counties	889,099	928,487	47,285	52,972	11,286	153
Total State	7,884,919	7,941,060	346,479	352,728	198,765	86,297
Increase	−56,141	227,824	−6,249	39,796	1,976	−5,276

LIVESTOCK WITHIN AND WITHOUT GOYDER'S LINE OF RAINFALL, 1932 TO 1934.

Year.	Sheep.		Cattle.		Horses.	
	Total.	Percentage.	Total.	Percentage.	Total.	Percentage.
			Within Goyder's Line of Rainfall.			
1932	4,803,728	62·28	223,716	71·49	139,231	73·19
1933	5,217,669	65·70	249,387	70·70	142,490	72·41
1934	5,310,764	67·35	250,738	72·37	145,199	73·05
			Without Goyder's Line of Rainfall.			
1932	2,909,508	37·72	89,216	28·51	50,991	26·81
1933	2,723,391	34·30	103,341	29·30	54,299	27·59
1934	2,574,155	32·65	95,741	27·63	53,566	26·95

WOOL PRODUCTION.

Division.	Wool Clip.			Average Weight Fleece.		
	1934-35.	1933-34.	Increase.	1934-35.	1933-34.	Increase.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Central	12,892,385	13,136,261	−243,876	7·85	8·04	−0·19
Lower North	10,331,953	11,002,521	−670,568	8·47	8·71	−0·24
Upper North	8,958,033	8,927,704	30,329	9·28	8·69	0·59
South-Eastern	11,683,627	10,796,754	886,873	7·74	7·58	0·16
Western	10,138,861	8,874,004	1,264,857	8·11	7·73	0·38
Murray Mallee	5,110,176	5,001,285	108,891	8·16	8·65	−0·49
Total counties	59,115,035	57,738,529	1,376,506	8·19	8·16	0·03
Outside counties	9,432,259	9,929,753	−497,494	10·29	9·60	0·69
Total State	68,547,294	67,668,282	879,012	8·43	8·34	0·09

Grand Total Wool Production **(clip, fellmongered and on skins exported), subject to slight revision, 1933-34, 79,288,903lbs.; 1934-35, 77,500,000lbs.; decrease, 1,788,903lbs.**

Minus sign denotes decrease.

IMPORTANT WEEDS OF SOUTH AUSTRALIA.

[By G. H. Clarke, B.Sc., Botanist at the Roseworthy Agricultural College.]

No. 16.—MILK WEED.

Euphorbia Drummondii, Boiss.

Euphorbia Drummondii is a native species of frequent occurrence on roadsides and vacant ground during the late autumn and early winter months, and so may be very much in evidence at a time when other green feed is relatively scarce. Under such conditions it is liable to be eaten by stock and may cause serious and even fatal poisoning effects. It is one of those plants from which prussic acid is set free, and although the toxicity appears to vary between wide limits in the case of specimens collected from different localities, and at different times, it has been proved in some cases to be intensely poisonous, and as little as 1lb. of the fresh leaves may contain sufficient cyanogenetic material to cause death in sheep. Travelling stock are particularly susceptible, owing partly to the fact that such animals are usually hungry, and partly to the relative abundance of the plants along the roadsides.

The name "Milk Weed" is due to the presence of a copious milky sap, or *latex*. Unfortunately, this character does not distinguish *E. Drummondii* from other species of *Euphorbia*, or, indeed, from other latex-producing types. The presence of latex is a noticeable feature of many different plants, and is characteristically found in certain families, among which the *Euphorbiaceae* (Spurges), *Moraceae* (Fig, Mulberry), *Apocynaceae*, and *Asclepiadaceae*, are of especial economic importance since the latex of certain of their species furnishes the india rubber of commerce. The same character is found also in the *Papaveraceae* (Poppies), the latex from one species of which (*Papaver somniferum*) yields opium, and in one tribe of the *Compositae* (*e.g.*, in Sow Thistle, Dandelion, &c.). The name "Milk Weed" does not, therefore, sharply distinguish *E. Drummondii* from a number of other weeds; but the presence of latex, considered in conjunction with its prostrate, mat-like, habit of growth, is a useful guide to the rapid identification of this weed. Other names used for the plant are "Poison Weed," *"Flat Spurge," *"Red Soldier," and *"Caustic Weed."

The plant grows flat on the ground, forming circular or oval patches a foot or less in diameter. It is of a bluish-green colour, though the stems, the stalks and margins of the leaves, and the flowers are often tinged with red, especially on their upper sides. There is a short vertical stem continuous below with the main root, and producing, near the ground level, numerous slender horizontal stems which spread outwards radially and branch repeatedly so as to form a dense prostrate mat. The stems are broadened somewhat at the nodes and have a jointed appearance which is enhanced by the presence of membranous stipules between the bases of the opposite leaves. The leaves are small, about ¼in. long, ovate-oblong, slightly notched at the summit, and with entire or minutely serrulate margins. Each leaf has a short stalk, and the base of the blade is very oblique. Though the leaves are in opposite pairs they are not attached to diametrically opposite sides of the stem at each node. The arc of circumference connecting the bases of the leaves of each pair is much shorter on the under than on the upper side. The leaf bases are continuous with membranous stipules, which are much better developed on the side in contact with the ground, becoming more lacerated and shorter on the uppermost side. Lateral branches arise in the axils of certain of the paired leaves, and the so-called "flowers" or cyathia are situated in corresponding positions at the upper nodes of the stems and branches.

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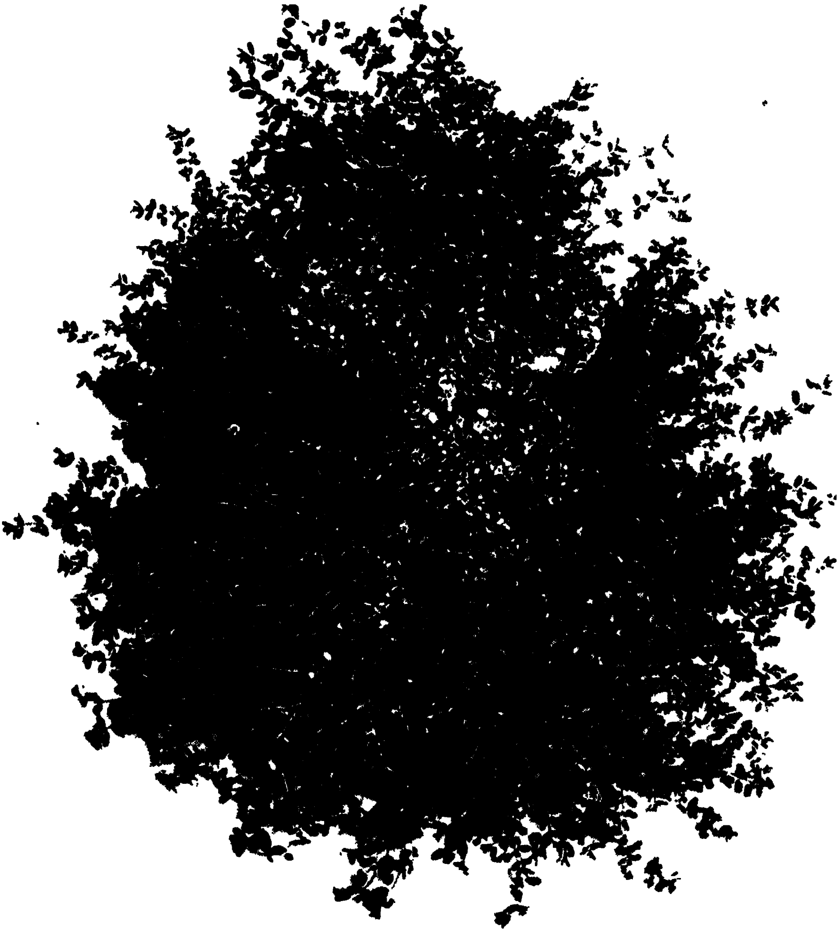
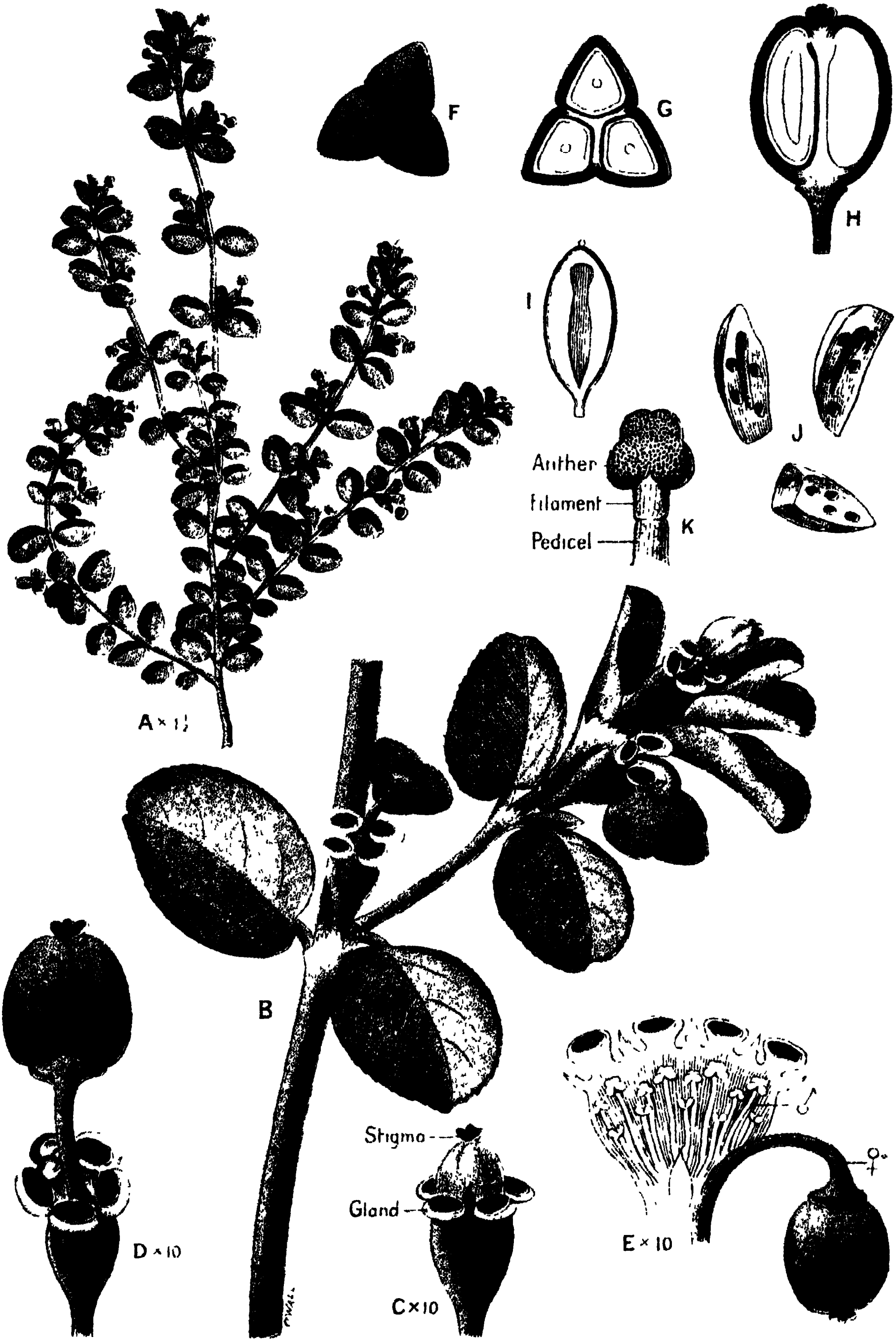
* See C.S.I.R. Pamphlet, No. 49, "Some Important Poison Plants of North Australia."

The angle made by a leaf with the stem from which it arises is usually more or less acute, and, in normal erect shoots where the longitudinal axis of the stem is nearly perpendicular to the plane of the leaf-blade, the base of the blade is usually symmetrically developed. On the other hand, where the axis of the stem comes to lie in the same plane as the leaf surface, as a result, either of the stem assuming a prostrate habit as in *Euphorbia Drummondii*, or of the leaves assuming a vertical arrangement as in the older leaves of most *Eucalypts*, the part of the leaf-blade situated proximal to the midrib usually undergoes greater development than the part on the side directed towards the apex of the stem. Thus the obliquity of the base of the leaf-blade is connected with an arrangement of the leaves edge-on to the stem, an arrangement which necessitates a twisting of the leaf-stalks, and one which is facilitated by the shifting of the leaf attachments



Single plant of *Euphorbia Drummondii* viewed from above. See coloured plate opposite.



MILK WEED (*Euphorbia Drummondii* Boiss.)

A.—Portion of plant slightly enlarged. B.—Single branch much enlarged showing arrangement of inflorescences (cyathia). C.—Young cyathium. D.—Older cyathium.
E.—Cyathium opened out showing central female flower and numerous male flowers ♂.
F.—Young capsule seen from above. G.—The same in transverse section.
H.—The same in median vertical section I.—Single coccus of capsule removed.
J.—Seeds. K.—Male flower (greatly enlarged).

towards the under-side of the prostrate stem. All of these characters combine, in *Euphorbia Drummondii,* to produce an appearance of flatness and regularity which is very striking.

Botanical Name and Classification.--The name *Euphorbia,* according to Pliny, was given to an African species in honour of *Euphorbus,* Greek physician to the King of Mauretania; *Drummondii* means "belonging to (*i.e.,* named after) Drummond." The name *spurge* (Latin *ex,* "out of," and *purgare,* "to purge") is given to the genus *Euphorbia* on account of the purgative properties of certain species. *Euphorbia* is the principal genus of the *Euphorbiaceae,* a family of considerable importance both medicinally and commercially. Rubber is obtained from several Euphorbiaceous plants, the most important economic species being *Hevea brasiliensis,* and *Manihot glaziovii,* both of which are cultivated for this purpose. Other species of the latter genus, *e.g., M. utilissima* or Cassava, yield tapioca. *Croton* and *Ricinus* (Castor Oil Plant) are of importance in medicine. The great majority of plants belonging to the family are poisonous, and contain a milky latex which is usually acrid, and sometimes caustic. Of the 220 genera and 4,000 species comprised, the greater number occur in the tropics, but the family is well represented in the temperate parts of the world. The general habit is extremely varied, even within the single genus *Euphorbia,* and includes, in addition to shrubs and trees which are most numerous, herbs, cactus-like forms, plants with scale leaves and assimilating stems, and a few woody climbers. The 37 genera occurring in Australia are mostly herbs or shrubs. The family is represented in this State by 11 genera and about 30 species, in addition to a number of introduced forms.

Botanically the family is related, by the structure of the pistil, to the Geraniums, but it possesses certain unique characters as regards the arrangement and, in some genera, extreme reduction of the flowers. These are unisexual, and the male and female flowers may be borne on the same or on different individuals. The detailed arrangement of the flowers is very variable, but they are usually grouped together in cymes. The reduced flowers may be arranged in partial inflorescences, which, in turn, may be associated together to form large compound inflorescences. The partial inflorescences may, as in *Euphorbia,* be so condensed as to appear like single flowers. The female flowers have a superior ovary of three united carpels with one or two pendulous ovules in each loculus. The resulting fruit separates, often elastically, from the central column, and breaks up into its constituent carpels or cocci, the latter undergoing dehiscence simultaneously to liberate the seeds. The division of the family into genera depends upon the structure of the embryo in the seed, the number of ovules in each compartment of the ovary, the presence or absence of latex, and the arrangement of the inflorescences and flowers.

The Genus Euphorbia.—This genus is distinguished from others chiefly by the presence of a very characteristic partial inflorescence of reduced flowers termed a *cyathium.* The cyathia of *Euphorbia* resemble single flowers and were originally believed to be of this nature. Actually they consist of a number of greatly reduced male flowers arranged in five groups surrounding a single centrally placed female flower, the whole being enclosed within an involucre composed of five united bracts. The cyathia may be solitary and axillary, as in *E. Drummondii,* but in many species they are grouped together to form compound inflorescences which may be conspicuously coloured. For example, in the garden Poinsettia, which is *Euphorbia pulcherrima,* the cyathia are arranged in groups surrounded by large bracts coloured bright red.

The central axis of a cyathium terminates in a solitary female flower consisting of a superior trilocular ovary surmounted by three styles and borne upon a pedicel, which is at first short and straight, but subsequently becomes elongated and bent, so that the ripe ovary hangs downwards between the bracts on one side of the involucre. Immediately below the ovary is situated a ridge or hypogynous disc representing the position of attachment of the undeveloped perianth. The central female flower is surrounded by a variable number of reduced male flowers arranged in five groups, the oldest flowers of each group being situated nearest the centre. Each group is subtended by one of the bracts. The male flowers consist of a single stamen only. The filament of the stamen is continuous below with the pedicel or stalk of the flower, the point of junction being indicated by a constriction which, in certain other Euphorbiaceous plants, gives attachment to a rudimentary perianth. Bracteole-like structures may be present at the base of each pedicel. The five surrounding bracts are firmly united together except on one side, and, corresponding in position to each of the points of junction is a conspicuous gland, variously shaped in different species of *Euphorbia.* These glands may represent modifications of the united stipules of adjacent bracts, or they may be formed by the fusion of lateral branches of the inflorescence with contiguous parts of the bracts. Only four glands are present on each cyathium.

Euphorbia is a very large genus and comprises about 700 species, of which 18 are native to Australia. In this State there are 11 species, 6 of which have been introduced from Europe, while the remaining 5, including *E. Drummondii,* are native. *E. Drummondii* is distinguished from other species by having the leaves opposite and with interpetiolar stipules, by the small size of the cyathia and their arrangement singly in the leaf axils, by the red entire glands bordered by a pink or white membrane, by the absence of a caruncle from the seed, and by the glabrous and prostrate habit, etc.

Botanical Description.—A prostrate glabrous herb forming at length a perennial rhizome. Leaves opposite, orbicular-ovate or oblong, obtuse or notched, entire or serrulate, very oblique at the base, about ¼ inch long. Stipules entire, fringed, or lobed. Cyathia small, shortly stalked, in the upper leaf axils. Involucres very short, the glands red, with a very narrow pink or white border, entire or nearly so. Capsule glabrous, very small; styles notched; seeds whitish, rugose.

As a result of investigations carried out in New South Wales under the Poison Plants Committee of the Council for Scientific and Industrial Research, the presence of prussic acid has been demonstrated in the stomach contents of sheep in which death followed the administration of extracts of *Euphorbia Drummondii.* The presence in the plant, however, of cyanogenetic glucosides in sufficient amounts to cause fatal poisoning seems to be the exception rather than the rule. Of several hundred plants examined from various parts of New South Wales it is reported that less than 10 per cent. were poisonous, and that most of these came from certain districts of the State; also that the number of poisonous plants was relatively greater in summer and autumn than at other periods of the year. According to Seddon, the conditions which determine the production of cyanogenetic glucoside in this plant are not yet known. That it may, under certain conditions, cause rapidly fatal results seems to be definitely established.

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OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
	1	44	
	2	34	
B. Cooke,	3	42	120
Kanmantoo.	4	49	
	5	61	
	6	66	176
			296
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
	13	58	
	14	—	
A. H. Matthews,	15	74	132
Bridgewater	16	66	
	17	52	
	18	37	155
			287
	19	5	
	20	32	
H. F. Muirson,	21	22	59
Yundi.	22	35	
	23	59	
	24	58	152
			211
	25	58	
	26	77	
E. McKee,	27	79	214
5, Rose Street,	28	79	
Carrondown.	29	82	
	30	66	227
			441
	31	29	
	32	65	
H. C. Stacy,	33	76	170
Meadows.	34	31	
	35	54	
	36	79	164
			334
	37	12	
	38	22	
T. Cleaver,	39	50	84
Bridgewater.	40	59	
	41	16	
	42	34	109
			193
	43	42	
	44	—	
	45	53	95
C. Sandstrom,	46	23	
Yundi.	47	24	
	48	67	114
			209

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
	49	40	
	50	72	
A. J. Monkhouse,	51	53	165
Woodside.	52	71	
	53	23	
	54	44	138
			303
	55	44	
	56	58	
J. F. Smith,	57	7	109
Meadows.	58	20	
	59	2	
	60	65	87
			196
	61	61	
	62	47	
A. Young,	63	48	156
Bridgewater.	64	15	
	65	63	
	66	44	122
			278
	67	37	
	68	37	
R. W. McAlistor,	69	57	131
Yundi.	70	24	
	71	12	
	72	39	75
			206
	73	68	
	74	67	
T. Duhring,	75	29	164
Mallala.	76	36	
	77	58	
	78	60	154
			318
	79	36	
	80	32	
R. J. Underdown,	81	66	134
Meadows.	82	33	
	83	52	
	84	61	146
			280
	85	29	
	86	60	
S. Hill,	87	56	145
Bridgewater.	88	57	
	89	66	
	90	48	171
			316
	91	11	
	92	27	
W. R. Hedger,	93	28	66
Yundi.	94	36	
	95	10	
	96	36	82
			148

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs.	
		Progressive to 31st July, 1935.	Totals
Langmaid & Bettison, Salisbury.	97	14	
	98	34	
	99	20	68
	100	52	
	101	12	
	102	—	64
			132
E. Portlock, Meadows.	103	72	
	104	46	
	105	52	170
	106	39	
	107	32	
	108	64	135
			305
Murray Powell, Jupiter Creek.	109	70	
	110	6	
	111	54	130
	112	29	
	113	78	
	114	35	142
			272
G. W. Bignell, Meadows.	115	58	
	116	35	
	117	25	118
	118	32	
	119	57	
	120	57	146
			264
W. M. Field, Yundi.	121	48	
	122	18	
	123	31	97
	124	4	
	125	41	
	126	61	106
			203
C. R. Wharton, Meadows.	127	49	
	128	58	
	129	61	168
	130	64	
	131	52	
	132	61	177
			345
H. H. Hefford, Murray Bridge.	133	40	
	134	64	
	135	52	156
	136	23	
	137	67	
	138	46	136
			292
F. W. Gage, Meadows.	139	38	
	140	1	
	141	dead	39
	142	53	
	143	21	
	144	33	107
			146
W. H. L. Norman, Echunga.	145	63	
	146	38	
	147	—	101
	148	68	
	149	38	
	150	15	121
			222
B. R. Whittington, Yundi.	151	65	
	152	9	
	153	30	104
	154	54	
	155	53	
	156	22	129
			233
B. C. Sanders, Meadows.	157	56	
	158	64	
	159	63	183
	160	55	
	161	4	
	162	12	71
			254
H. H. Gallagher, Pooraka.	163	12	
	164	43	
	165	54	109
	166	20	
	167	12	
	168	50	82
			191
W. Sickert, Meadows.	169	70	
	170	31	
	171	60	161
	172	42	
	173	67	
	174	69	178
			339
W. Restall, Echunga.	175	10	
	176	—	
	177	21	31
	178	51	
	179	36	
	180	61	148
			179
A. G. Dawes, 230, Portrush Road, Glenunga.	181	60	
	182	36	
	183	27	123
	184	6	
	185	45	
	186	61	112
			235
G. W. Sykes, Yundi.	187	49	
	188	15	
	189	23	87
	190	23	
	191	22	
	192	58	103
			190
R. Bartley, Meadows.	193	41	
	194	69	
	195	53	163
	196	42	
	197	46	
	198	57	145
			308
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	29	
	200	30	
	201	43	102
	202	58	
	203	15	
	204	29	102
			204

Egg-laying Competition—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
J. J. Devlin, Meadows.	205	50	
	206	50	
	207	74	174
	208	48	
	209	20	
	210	68	136
			310
D. J. Foxwell, Echunga.	211	66	
	212	21	
	213	15	102
	214	14	
	215	51	
	216	3	68
			170
F. J. Buck, Meadows.	217	42	
	218	44	
	219	78	164
	220	47	
	221	49	
	222	37	133
			297
J. A. Grist, Yundi.	223	10	
	224	—	
	225	21	31
	226	2	
	227	—	
	228	34	36
			67
L. A. King, Meadows.	229	62	
	230	52	
	231	42	156
	232	—	
	233	49	
	234	3	52
			208
R. W. Sando, Echunga.	235	51	
	236	50	
	237	44	145
	238	50	
	239	46	
	240	23	119
			264
E. W. Young, Meadows.	241	64	
	242	48	
	243	42	154
	244	48	
	245	—	
	246	2	50
			204
A. Jarvis, Yundi.	247	46	
	248	22	
	249	17	85
	250	45	
	251	26	
	252	72	143
			228
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
S. Bridge, Yundi.	259	42	
	260	59	
	261	46	147
	262	26	
	263	42	
	264	26	94
			241
H. G. Egarr, Meadows.	265	55	
	266	55	
	267	23	133
	268	17	
	269	55	
	270	32	104
			237
R. H. Smith, Yundi.	271	60	
	272	30	
	273	41	131
	274	68	
	275	23	
	276	45	136
			267
J. M. Lawson, Meadows.	277	58	
	278	53	
	279	42	153
	280	47	
	281	58	
	282	46	151
			304
J. O. Marshall, Yundi.	283	6	
	284	37	
	285	46	89
	286	63	
	287	52	
	288	26	141
			230
G. Joyce, Meadows.	289	12	
	290	78	
	291	48	138
	292	56	
	293	60	
	294	44	160
			298
J. A. Bradtke, Yongala.	295	7	
	296	—	
	297	40	
		47	
W. H. A. Hodgson, Salisbury.	298	74	
	299	54	
	300	60	
		188	
A. W. McDonald, Gawler.	301	36	
	302	35	
	303	43	
		114	
J. H. Dowling, Glossop.	304	28	
	305	70	
	306	1	
		99	

Egg-laying Competition—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
A. P. Urlwin, Balaklava.	307	50	
	308	40	
	309	9	
		99	
L. S. Ekers, Mount Compass.	310	52	
	311	9	
	312	62	
		123	
V. E. Williams, Semaphore Park.	313	55	
	314	60	
	315	57	
		172	
F. P. Munzberg, Tanunda.	316	55	
	317	48	
	318	57	
		160	
Total Class 1		12,669	
Class 2—Any Other Light Breed.			
Langmaid & Bettison, Salisbury. (Black Minorcas.)	319	29	
	320	42	
	321	59	
		130	
A Heaysman, Government Road, Eden Hills. (Cuckoo Leghorns.)	322	36	
	323	72	
	324	36	
		144	
Total Class No. 2.		274	
Class No. 3—Black Orpingtons.			
A. G. Dawes, 230, Portrush Road, Glenunga.	325	32	
	326	14	
	327	77	123
	328	47	
	329	37	
	330	35	119
			242
H. J. Mills, 108, Edward Street, Edwardstown.	331	51	
	332	43	
	333	38	132
	334	30	
	335	55	
	336	dead	85
			217
K. Pennack, Pooraka.	337	67	
	338	52	
	339	15	134
	340	61	
	341	47	
	342	22	130
			264
H. H. Gallagher, Pooraka.	343	42	
	344	19	
	345	42	103
	346	43	
	347	31	
	348	16	90
			193

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
B. Cooke, Kanmantoo.	349	17	
	350	23	
	351	19	
		59	
H. H. Hefford, Murray Bridge.	352	58	
	353	16	
	354	25	
		99	
J. H. Dowling, Glossop.	355	14	
	356	14	
	357	47	
		75	
L. S. Ekers, Mount Compass.	358	42	
	359	22	
	360	41	
		105	
A. G. Dawes, 230, Portrush Road, Glenunga.	452	1	
	453	26	
	454	32	59
	455	1	
	456	43	
	457	38	82
			141
A. P. Urlwin, Balaklava.	465	29	
	466	43	
	467	35	
		107	
Total Class No. 3		1,502	
Class No. 4.—Any Other Heavy Breed.			
H. J. Mills, 108, Edward Street, Edwardstown. (Rhode Island Reds.)	361	1	
	362	dead	
	363	23	24
	364	88	
	365	60	
	366	dead	148
			172
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	367	36	
	368	36	
	369	22	94
	370	48	
	371	40	
	372	20	108
			202
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens. (Rhode Island Reds.)	373	40	
	374	55	
	375	29	124
	376	3	
	377	26	
	378	24	53
			177
V. F. Gameau, Findon Road, Woodville. (Rhode Island Reds.)	379	16	
	380	67	
	381	71	154
	382	51	
	383	12	
	384	47	110
			264

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
K. Pennack, Pooraka. (Barnevelders.)	385	37	
	386	37	
	387	27	101
	388	51	
	389	47	
	390	68	166
			267
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	458	2	
	459	27	
	460	57	86
	461	15	
	462	34	
	463	41	90
			176
Total Class No. 4			1,258

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.	
G. R. Cowell, Balhannah.	391	59	
	392	22	
	393	7	88
	394	18	
	395	18	
	396	50	86
			174
A. J. Monkhouse, Woodside.	397	36	
	398	44	
	399	41	121
	400	28	
	401	42	
	402	52	122
			243
G. R. Cowell, Balhannah.	403	48	
	404	34	
	405	25	107
	406	31	
	407	23	
	408	22	76
			183
Total Class No. 5			600

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.
W. R. Christie, Upper Mitcham.	409	45
	410	10
	411	33
		88
Total Class No. 7		88

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	37
	413	26
	414	48
		111
Total Class No. 8		111

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.
Peter Western, Ascot Park School. (White Leghorn.)	415	71
Peter Western, Ascot Park School. (White Leghorn.)	416	67
William Sando, Echunga School. (White Leghorn.)	417	43
Douglas Marshall, Yundi School. (White Leghorn.)	418	47
Norman Page, Murray Bridge School. (White Leghorn.)	419	44
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	41
Dean Colwell, Grange School (White Leghorn.)	421	33
Warren Hannaford, Paracombe School. (White Leghorn.)	422	64
W. Horne, Woodville School. (White Leghorn.)	423	59
Owen Robinson, Ascot Park School. (White Leghorn.)	424	63
June Chapman, Woodchester School. (White Leghorn.)	425	22
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	41
Jack O'Sullivan, Morphett Vale School. (White Leghorn.)	427	56
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	19
James Taylor, Morphett Vale School. (White Leghorn.)	429	44
William Gregory, Victor Harbour School. (White Leghorn.)	430	25
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	14
Clifford Burford, Smithfield School. (White Leghorn.)	432	8
Tom Callaghan, Smithfield School. (White Leghorn.)	433	—
Eric Pratt, Abattoirs School. (White Leghorn.)	434	71
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	55
Alan Yelland, Cunliffe School. (Minorca.)	436	35
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	42

Egg-laying Competition—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st July, 1935.
Clarence King, Tarlee School. (White Leghorn.)	438	6
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	78
Donald Heading, Sturt School. (Black Orpington.)	440	61
Olive Steer, Sturt School. (Black Orpington.)	441	44
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	68
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	72
Ray Candy, Noarlunga School. (Black Orpington.)	444	31
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	70
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	43
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	21
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	44
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	67
John Keldoulis, Orroroo School. (Black Orpington.)	450	48
Bruce Dooland, Thebarton School. (Black Orpington.)	451	9
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	2
Total		1,628

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. Anderson, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April to 30th June.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 30th June, 1935.	No. Eggs Laid Month of July, 1935.	Total Eggs Laid 1st April, 1935, to 31st July, 1935.
No. 1 Test	1,192	536	1,728
No. 2 Test	1,258	518	1,776
No. 3 Test	1,156	656	1,812
No. 4 Test	905	559	1,464
No. 5 Test	924	541	1,465

DEPARTMENT OF AGRICULTURE.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

WINTER TEST.

LEADING SCORES TO MONTH ENDED 31st JULY, 1935.—
FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—White Leghorns.

Singles—

	Eggs Laid.	Bird Nos.
E. McKee	82	29
E. McKee	79	28
E. McKee	79	27
H. C. Stacy	79	36

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SPRING, 1935.

ECGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

BLACK ORPINGTONS.

EGGS.—10/- per Setting of 15 Eggs. Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—17/6 per dozen; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

Free on Rail,
Salisbury.

DELIVERY.—CHICKS—July to September.
EGGS—July to September.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

Trios—		
E. McKee	227	28–30
E. McKee	214	25–27
W. H. A. Hodgson	188	298–300
Teams—		
E. McKee	441	25–30
C. R. Wharton	345	127–132
W. Sickert	339	169–174

Class No. 2.—Any other Light Breed.

Singles—		
A. Heaysman (Cuckoo Leghorn)	72	323
Langmaid and Bettison (Black Minorca)	59	321

Class No. 3.—Black Orpingtons.

Singles—		
A. G. Dawes	77	327
K. Pennack	67	337
K. Pennack	61	340
Trios—		
K. Pennack	134	337–339
H. J. Mills	132	331–333
K. Pennack	130	340–342
Teams—		
K. Pennack	264	337–342
A. G. Dawes	242	325–330
H. J. Mills	217	331–336

Class 4.—Any other Heavy Breed.

Singles—		
H. J. Mills (Rhode Island Red)	88	364
V. F. Gameau (Rhode Island Red)	71	381
K. Pennack (Barnevelder)	68	390
Trios—		
K. Pennack (Barnevelder)	166	388–390
V. F. Gameau (Rhode Island Red)	154	379–381
H. J. Mills (Rhode Island Reds (2 birds only competing)	148	364–366
Teams—		
V. F. Gameau (Rhode Island Reds)	264	379–384
K. Pennack (Barnevelder)	267	385–390
A. G. Dawes (Rhode Island Reds)	202	367–372

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Singles—		
G. R. Cowell	59	391
A. J. Monkhouse	52	402
G. R. Cowell	50	396
Trios—		
A. J. Monkhouse	122	400–402
A. J. Monkhouse	121	397–399
Teams—		
A. J. Monkhouse	243	397–402
G. R. Cowell	183	403–408

Class No. 6.—Black Orpingtons.

Singles—		
W. R. Christie	45	409

Class No. 8.—Any other Heavy Breed.

W. R. Christie	48	414

SECTION 3.—WET MASH.

Singles—		
Olive Pitman, Gilles Plains (Black Orpington)	78	439
Lyol Stone, Morphett Vale (Black Orpington)	72	443
Peter Western, Ascot Park (White Leghorn)	71	415
Eric Pratt, Abattoirs (White Leghorn)	71	434
Malcolm Booth, Bridgewater (Black Orpington)	70	445

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE OF UPPER NORTH BRANCHES.

In declaring open the Annual Conference of Upper North Branches of the Agricultural Bureau, which was held at Booleroo Centre on 17th July, the Hon. A. L. McEwin, M.L.C. (member Advisory Board of Agriculture) paid a tribute to the enthusiasm of members associated with the Branches of the Bureau in the Upper North district of the State. It was particularly pleasing, he said, to see what he thought to be a record attendance at an opening session of any Conference, the number present being estimated at 300. He regretted that they had not shared in the good rains which had recently been recorded in other parts, but, with the true optimism of the northerners, they were still hopeful of getting a good rain. Delegates were present from the following Branches:—Wilmington, Morchard, Murraytown, Laura, Appila, Wirrabara, Eurelia, Baroota, Yandiah, Booleroo Centre, Melrose, Gladstone, and Wepowie.

Professor A. J. Perkins (Director of Agriculture), Messrs. R. C. Scott (Supervisor Experimental Work), H. B. Barlow (Chief Dairy Instructor), E. L. Orchard and J. O. Hatter (District Instructors), C. A. Goddard (Assistant Wool Instructor, School of Mines), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary Agricultural Bureau), attended on behalf of the Department of Agriculture. Mr. W. G. Gregurke (Wepowie) occupied the chair. The following papers were read and discussed:—"Farm Economy," R. M. Harvie (Appila); "Farm Machinery," A. Scholz (Murraytown); "Hobbies," P. J. Curnow (Wirrabara). The agenda contained a large number of questions dealing with fertilisers, quality in wheat, wheat prices, and horticultural subjects, which were answered by officers of the Department of Agriculture. The following resolutions were carried.

Diabolo Separator Coy (S.A.) Ltd.
117-119 CURRIE STREET,
ADELAIDE.

"That the Government be asked to amend the Noxious Weeds Act to accept responsibility for the destruction of noxious weeds on all stock roads within district council boundaries."

"That a system of bulk handling of wheat be commenced immediately in the farming areas of this State."

"That the judges' score cards be put on exhibits of wheat taken from crop competitions and displayed at the Royal Agricultural and Horticultural Society Show."

The Hon. A. L. McEwin, M.L.C., presented life membership certificates of the Agricultural Bureau to Messrs. J. F. Burns (Wepowie) and R. Kitto (Black Rock).

At the evening session Mr. C. A. Goddard gave an address, "Management of the Farm Flock."

The members of the Wepowie Branches staged an exhibit, which included green fodders, vegetables, cereals, preserved fruits, and jams, dairy produce, dressed poultry, and a collection of women's needlework and other handicrafts. They also provided an excellent luncheon and tea for the visitors. A report of the Conference would not be complete without an appreciation of the manner in which the Conference was organised, and the Committees and Hon. Secretaries of the Wepowie Branches are worthy of special mention.

CONFERENCES AT KAROONDA AND LAMEROO.

Mr. A. J. A. Koch (member, Advisory Board of Agriculture) delivered the opening address at the Conference of Western Murray Lands Branches of the Agricultural Bureau, which was held at Karoonda—under the auspices of the Borrika Branch—on August 6th. Mr. O. W. Jones presided, and Messrs. W. J. Spafford (Deputy Director of Agriculture), R. C. Scott (Supervisor of Experimental Work), R. L. Griffiths, P. H. Suter, E. Leishman (District Instructors), H. C. Pritchard (General Secretary, Agricultural Bureau), and F. C. Richards (Assistant Secretary) attended on behalf of the Department of Agriculture. Delegates were present from the Chapman's Bore, Yurgo, Wynarka, Copeville, Coomandook, Moorlands, Karoonda, Kulkawirra, and Borrika Branches. The agenda included a variety of questions relating to stock feeding, milling quality of wheats, fat lambs, &c., which were answered by officers of the department, and the following papers were read and discussed:—"Is the Farmer an Asset to the State or a Liability?" (Mr. E. L. Cowled, Borrika), "The Future of the Murray Mallee" (Mr. R. Elliot, Kulkawirra). "Methods of Cropping" (Mr. J. Bullen, Yurgo), "The Horse on the Farm" (Mr. G. H. Sutherland, Copeville), "Experiences in Fruit Growing on Murray Mallee" (Mr. W. R. Trestrail, Coomandook), "Birds and Their Value to the Man on the Land" (Mr. M. Ballard, Coomandook).

Conference decided:—"That next year's gathering should be held at Karoonda, the Yurgo Branch to be responsible for the arrangements."

"That the Conference express its hearty appreciation of the services rendered by Mr. R. L. Griffiths (District Agricultural Instructor), and trusts that his services will be retained."

"That the Advisory Board of Agriculture and Farmers' Assistance Board should work on more co-operative lines in regard to applicants under the Act."

"That the method used by the Yurgo Branch for their local District Crop Competition be discussed with a view to having the District Crop Competition brought under the same conditions, which are as follows:—Area to be judged, 50 acres; plan of area together with a previous history of cultivation to be in the hands of the Branch Secretary not later than July. That there be 10 entries or no competition. Any farmer may have more than one area entered, and may show three varieties in any one piece. To be three prizes, but no farmer to get more than one prize in any one year."

"That the dock on bleached wheat is a matter for investigation by the Advisory Board."

At the evening session Mr. Spafford spoke on his recent trip abroad.

PINNAROO LINE BRANCHES.

Presided over by Mr. E. A. Blake (Chairman of the Lameroo Bureau). Branches of the Agricultural Bureau situated along the Pinnaroo Line held their Annual Conference at Lameroo on August 8th. Rain which fell during the morning session of the Conference somewhat adversely affected the attendance, later there was a good representation of delegates from the Parilla Well, Parrakie, Parilla, Geranium, Pinnaroo, Clanfield, Karte, and Lameroo Branches. Mr. A. J. A. Koch (Member of the Advisory Board), delivered the opening address, in the course of which he explained the functions of the Board, and made reference to recent activities of the Bureau, emphasising the progress that had been made by Women's Branches. Conferences of the Agricultural Bureau in the immediate past had devoted practically the whole of their discussions to general farm efficiency in the various phases of agriculture. He thought that future gatherings should consider the advisability of giving consideration to what were to be the future farm practices of the Mallee districts. To the Branch representatives for next year's Conference he suggested that a Committee might be formed which would decide on the subjects that would be included on the Agenda.

Mr. C. H. Ross, of Pinnaroo, read a paper, "Colt Breaking," and Mr. L. Orwell (Lameroo) discussed the subject, "Can more Use be made of the Department of Agriculture and the Agricultural Bureau by the Man on the Land?" "Fat Lamb Breeding in the Mallee" was the subject of a paper contributed by Mr. R. Jenkins, of Lameroo.

Messrs. W. J. Spafford and R. C. Scott took part in the discussions following the reading of the papers, and replied to questions submitted by delegates.

It was decided to hold the 1936 Conference at Pinnaroo.

Mr. R. L. McKenzie (Pinnaroo) moved and Mr. L. Orwell (Clanfield) seconded a motion that the Advisory Board be asked to set up a Chamber of Rural Primary Products through the Agricultural Bureau.

A Committee consisting of Messrs. R. L. McKenzie (Pinnaroo), L. Orwell (Clanfield), and R. Jenkins (Lameroo) was appointed to draw up and submit to the Advisory Board a scheme for the institution of the Chamber.

Mr. H. G. Johnston (Secretary of the Chandos Crop Competition Committee) gave a report of the 1934-35 season, and Mr. Spafford made the following presentations:—First, F. H. Whittlesea, Jabuk, 92 points, writing desk; Second, C. W. Rundle, Lameroo, 91½ points, E.P. coffee pot; Third, H. A. Steer, Lameroo, 90½ points, stainless cutlery; Fourth, E. Ross, Parrakie, 88½ points, water jug and glasses. The junior Competition was won by Master Ron Neindorf, Parilla, set of hair brushes.

The Lameroo Branch entertained delegates at tea, and at the evening session Mr. Spafford spoke on his trip to South America.

PURSUIT OF KNOWLEDGE.

The main purpose and endeavour of active educational effort must necessarily be the training and equipping of youth to face and successfully surmount the trials and problems of life.

In all things, a habit commenced in childhood, while the mind and individuality are plastic, is far more likely to prove lasting than when begun later in life.

It was with a full conception of at least one great purpose in the pursuit of knowledge that the Commonwealth Savings Bank planned its service to apply as directly for the benefit of children as for adults. The depositing of regular weekly sums in a Savings Bank account is a practical and logical illustration of the thrift lesson, and the Commonwealth Savings Bank has extended its facilities throughout all Australia to make that lesson easy and valuable.

Commonwealth Savings Bank of Australia

PAPERS READ AT CONFERENCES.

UPPER NORTH CONFERENCE, BOOLEROO CENTRE, 16th JULY.

FARM ECONOMY.

[R. M. HARVIE, Appila.]

Farming at present is a non-payable proposition and one is often at a loss to know just where economy begins or ends and whether money spent for extra labour or plant is really economy or extravagance. Unless the farm is too small, it pays to employ. Economy lies not so much in rigidly curtailing all expenditure as in spending wisely and putting money into farming operations that would show more profit. Very often it is false economy to persevere too much with old harvest machinery, when it has become badly worn and especially when the harvester becomes a wheat waster. A farmer could easily lose enough wheat to pay a deposit on a new machine. The same applies to employing men in the harvest operations who are careless about their work. Power farming is too expensive at the present price of wheat. During the last few years the horse breeders have had a good harvest, so by using horses and breeding a couple of foals each year one would again be economising. All harness leather should be well oiled with neatsfoot oil. The cost of the oil would more than doubly pay for itself. Good oil and a good oilcan should be a golden rule with all farmers. Oil is cheaper than bearings. It is no trouble to get a man to oil a machine well if he has a good oilcan to do it with, and a few shillings spent in that direction may mean pounds saved in bearings. It is often good economy to have an assortment of nuts and bolts on the farm, and a pound or two spent in that direction is a good idea. A good supply of scrap iron would be most useful at the farm smithy. A pound or two spent to secure an old machine at a sale would often return 10 times its value in bolts and iron that one could get out of them. A good set of wrenches and proper tools saves time when making repairs. One should always work with a system and keep up the seasonal jobs, especially field work. See that the harvester and binder are in perfect order before commencing with them, because, really speaking, time is economy, more so when one loses the time during the harvest. A substantial economy could be effected by farmers combining to buy their own necessities, particularly cornsacks. I believe if we were to send direct to the manufacturers it would be surprising what we could save. Super bags can be washed carefully and used for seed wheat or for oats or barley and may be used for rugging sheep. Crushed grain for stock is much to be preferred in economy to the whole grain. The control of mice and rats, where possible, very greatly reduces the amount of waste on a farm. It is not always the hard worker alone who succeeds, but the man who thinks and works out his problems for himself. Stopping to think in certain directions helps in the way of economy. In another way good judgment also would be of an assistance. We know that we all do not do things alike, or it may be that we do a thing a certain way, and know no other better way, until someone tells us. Therefore, farmers should belong to the Bureau so as to help one another. Doing this would be another aid to farm economy.

HOBBIES.

[P. J. CURNOW, Wirrabara.]

To put spare time to profitable use, the adoption of a hobby is an excellent method to expand knowledge on some subject which has a natural appeal. In the latter connection, only something that satisfies some trait in character is taken up as a hobby. Some hobbies may be turned to profitable account, such, for instance, as amateur photography, but the average hobbyist is content to derive pleasure and instruction from his spare-time pursuit. It has been said that a boy with a hobby is generally a reliable boy, one who may be trusted to give close attention to his usual studies, and who can then turn for relaxation to some hobby that has a special appeal for him. It is unusual, indeed, to find young people who have not, even for a short time, taken up some hobby, either for amusement or instruction. Most boys and girls are somewhat erratic in their pursuit of spare-time callings. They enthuse very often for a short time over some special hobby which appeals for the time being, but which is readily thrown aside for something new. In this regard, they are no worse, possibly, than their elders, but there are exceptions, of course. How often has the keen and lasting pursuit of some hobby led to a choice of a successful career on similar lines? Many brilliant engineers date their success from the time when, as boys, they played with their toy trains or attempted to construct from directions given in boys' papers or simple textbooks articles of a mechanical character.

A child's natural bent will decide the type of hobby he or she will take up. The boy with an artistic flare will naturally turn to his paint box and easel. The girl who has a love for music does not mind the so-called drudgery of practising interminable scales. As she becomes more skilled the inherent beauties of pieces by the great masters are brought out, and in themselves are a reward for diligent work in the earlier stages of instruction. Where there is no inborn love of music, the young student soon tires of the study and gives up. Possibly a hobby of another type may make some appeal to this same young person, a hobby that may prove instructive and may hold the attention of the child for a lengthy period. There is an infinity of pastimes to suit every conceivable taste.

For boys the collecting of stamps is a most instructive hobby; the desire to make things appeals to many others. Here the instruction given at school in woodworking classes offers an excellent chance to bring out, in at least some boys, those traits which impel some hobbyists to want to make useful things from all kinds of wood in their spare time. Many young carpenters do very creditable work indeed. The keeping of live pets seems to appeal to almost every boy at some time or other. Too often though, some children soon tire of giving their animal friends that close attention in relation to feeding and watering which is so necessary for their wellbeing. The votaries of the camera are counted in their thousands, and the advent of the film camera has given a great impetus to the photographic art. In the old days when the amateur had to own almost a small drug shop to successfully take and develop photos the hobby was a messy one and fairly expensive to conduct. To-day everything has been so simplified that photography as a hobby makes a strong appeal to many who would not care to attempt the art under the old conditions. In addition to the amusement and instruction obtained from this particular form of hobby, profit can often be made from the sale of pictures.

Girls find pleasure and profit in knitting and making pretty things for the home. When most girls reach the age of 18 they begin to think of a Glory Box, and deft fingers turn out not only beautiful, but useful things.

The science of botany, the collecting and mounting of flowers when pressed, collecting shells, curios, chess, draughts, cross word puzzles, and every other form of pastime have their votaries. But in the field of sport Australian boys and girls find their greatest avenues for amusement. Every Australian boy who cannot play cricket of a sort is an oddity. A petrol tin wicket, an old tennis or rubber ball, and a bat chopped out of a bit of deal with the family chopper will form a good outfit for any young boy. Football, tennis, rounders are all good games, but do not in themselves constitute hobbies. They are games played in the mass, although, in some cases, they form the only pastimes some young people know.

The writer's advice to young people is "Adopt some form of hobby that makes an appeal to you. There is such a variety of useful pastimes young folk can take up. If you tire of one there may be others at hand more interesting. Fill in your time of leisure on the lines suggested, and not only will you gain something of profit to yourself, but will develop habits of industry and concentration as well that will help in your future career."

[*Papers Read at Conferences.*]

THE CARE OF FARM MACHINERY.

[A. SCHOLZ, Murraytown.]

Under the present conditions with wheat at a low price, one of the most serious problems the farmer of to-day is confronted with is the high cost of production. This cost can be reduced considerably by the care of farm machinery. Every implement on the farm costs money—hard earned money—and the initial cost is not the only expenditure to be considered. It is only after a farmer seriously considers whether he can afford it or not that he places his order for the machine he is in need of, and he most probably insures it against fire, but does he insure it against depreciation? He may do so for the first year or two, but when its shininess and paint work become dull, the machine is more or less neglected and the machine begins to rust. Rust is the cause of untold damage, and needless expenditure can easily be prevented without loss of time and by a modest outlay of money. Keep the oil from the crankcase of a motor, mix it with a little kerosene, or use it by itself, have a stiff paint brush, and paint all wood and ironwork with it freely, or a coat of boiled oil. This should be done prior to the use of the machine. Immediately the work of the machine is done for the year a coating of heavy oil to all wood and ironwork will prove to be of much benefit to it, and it is while doing this that all badly worn parts can be discovered, and should be replaced by new ones. The threads of all loose nuts should be covered with oil and the nuts tightened and covered with paint or oil, so that no time is lost the following season in undoing or cutting tight nuts if repairs are necessary. An hour spent in this way will save pounds of actual money and hours of time, which to a farmer are very valuable. How often does one see a machine left in the field rusting its life away? The maker of that machine guaranteed it to do certain work and to last, say, ten years with ordinary care. Without care and with the action of the elements on the ironwork, the machine will only last, say, seven or eight years, when a new machine will be necessary, thus greatly increasing the machinery bill on the farm. In many instances machinery that was scrapped in good times is now called on to render services again. The usefulness of any machine is shortened by neglect, such as bad lubrication, slack or missing bolts, loss of nuts, and wire instead of bolts. Wire may be all right for a makeshift, but not for a lasting job, and when replacing bolts, replace with ones of the correct size. Three of the most important points in connection with farm machinery are:—

1. *Use only the very best of lubricating oil and plenty of it,* remembering that it is cheaper to buy oil than new bearings.

2. *The Housing of Implements after use.*—All implements should be put under cover immediately after use, preferably under a galvanized iron roofed shed, enclosed on three sides either by galvanized iron or stone walls. Such a shed cannot be afforded in many cases, and a straw shed can be erected at a very low cost. A machine that is worked one month in the year and left standing under a tree for the remaining 11 months is damaged more during its idle period than during its working period.

3. *Common Sense on the Part of the Operator.*—At no time should the operator of the machine think that because the wheels are going around the machine is in sound working order; he should keep his eyes open and see that all cogs are in correct mesh and spindles running in true alignment, &c. Before starting the header at the beginning of harvest all oil cups should be cleaned out thoroughly, wicks placed in their right positions, and broken ones renewed. The cups can then be filled with kerosene; this will remove all gummy oil from the bearings and give fresh oil a good lead. During the working period of this machine there is always a day that the weather is unfit for reaping, and it is on such days that a farmer has the time to examine the machine and see that all nuts and bolts are tight, and all cogs in correct mesh. A cog meshed loosely will be very noisy and wear rapidly, while one that is meshed too tightly will give heavy running and throw undue strain on the bearings.

A little time spent in such a way not only adds longer life to the machine, but saves hours in good harvesting weather. When the machine is put in the shed after harvest, all belts should be given a dressing of neatsfoot oil to keep them pliable until next season.

The Combine.—In preparing the combine in readiness for seeding, tighten all loose nuts and bolts and put on a new set of shares; adjust strained tines, but if strained too badly replace them with new ones, so that all seed may be sown at an even depth. Oil wheat distributors and super star sockets; when this has been done, the combine is ready for seeding. Before starting each morning, be sure that the grain and fertiliser drives turn easily. When seeding operations are completed, clean all seed and super from the boxes and remove the rubber hoses. If these are washed clean of oil and super and put in the seed box until next season, they will last for many years. Remove super stars and soak them in water for a day so that they are free from all super, and then give them a coat of blacklead and put them back in the combine.

The Binder.—The binder is the machine that is used least of any machine on the farm, but while in use gives most trouble for the amount of work it does. This trouble can greatly be reduced with care. While the machine is in use, the canvasses should be slackened each night and tightened before starting to prevent them from stretching. Water should be poured on the knife two or three times a day, thus preventing it from becoming gummed, running stiff, and eventually breaking. Immediately the work of the machine has been completed for the year, the canvasses should be removed, rolled up, placed on the tray, and the machine placed in the shed.

Any engine that is used on the farm should be overhauled periodically, the cylinder head taken off, carbon removed, and valves ground.

All tools used on the farm should have their regular places in neatly made shelves in the blacksmith's shop, and after use returned to their places, so that they are close at hand when needed.

Neglect of machinery has meant the ruin of many a farmer, while the taking care of it leads to prosperity.

Mr. Scholz is one of the young members of the Bureau, and in the discussion that followed the reading of his paper, was sincerely congratulated on his excellent effort.

RIVER MURRAY BUREAU CONFERENCE, MOOROOK, 2nd JUNE.

GREEN MANURING.

[P. M. Wilksch, Berri.]

My experiences in Green Manuring and the conclusions arrived therefrom are confined to the classes of soil with which I am acquainted—the Berri sand, Berri sandy loam, Barmera sandy loam, and Murray sand.

It is proposed to first deal with the planting and cultivation of the cover crop, and finally to endeavour to weigh up the advantages against the disadvantages of Green Manuring as compared with other methods of enriching and improving the land.

Seeding.

Assuming that the cover crop is to be a leguminous one, I prefer to alternate the plants, using Beans one year and Peas the next. The end of March or beginning of April is the best time to sow, providing the soil is sufficiently moist, either from the last general irrigation or a fall of, say, 1in. of rain at that period. My practice is to cultivate twice after the irrigation, or to plough once with a 3-furrow plough (with the mouldboards removed) and then harrow. No further preparation of the seedbed is necessary. Broadcast the seed, for by this method the seed is distributed over a larger area than when a drill is used. When a wide drill is used there is danger of canes being torn off by the wheels (when rows of vines are being sown) or the heavily-laden and wide-spreading branches of citrus trees being damaged in the same way. As a drill covers a space of only 5ft. 3in. in width, if alternate rows of citrus trees spaced 20ft. apart are sown, only one eighth of each acre will be sown. This is not sufficient, as one wishes to obtain all the growth from the cover crop possible; therefore, broadcasting is the only safe method.

After the seed has been sown, the soil should be cultivated, then furrowed out (in preparation for a special light irrigation later on should such be necessary), then, finally, harrowed lightly. If this is done carefully with light harrows, it will not fill in the irrigation furrows. This preparation is necessary to keep the soil from setting and conserve moisture. The irrigation furrows are essential, for a later watering is almost certain to be required, and to resort to flooding the cover crop is most undesirable and likely to result in over watering.

This was tried on one occasion and it took four times the ordinary stream to get the water moving at all, and at the end of 48 hours it had not travelled beyond 4 chains; the lower part of the row received no water at all. I have also tried the alternate method of planting, *i.e.*, of first sowing the seed, then furrowing out and watering, but in the class of land under discussion this had the effect of "setting" the soil, and in the event of a spell of dry weather following the green crop soon wilted and showed signs of distress.

QUANTITY OF SEED TO SOW.

In broadcasting, use a liberal quantity of seed; 5bush. of Beans to the acre sown, though when Peas are used a smaller quantity is sufficient.

FERTILISING THE COVER CROP.

When the farmer sows his crop of wheat he uses about 50lbs. of super per acre. As a rule, the practice is to use 5 and sometimes up to 10 times the quantity of super when putting in a cover crop. The young plants cannot avail themselves of one-quarter of the fertiliser sown, and it is therefore not only economically wasteful, but an actual detriment to the cover crop. Again, using the farmer as an illustration, it will have been noticed that where a temporary choke of the drill has occurred and in freeing it a comparatively large quantity of super has been spilled, the result has been that in that spot there has been a short period of rampant growth of the wheat plant, which, however, is not maintained, and by harvest time that patch will be comparatively a failure. A cover crop fares the same in similar conditions. Providing the vines or trees have been liberally manured during the previous season, there is sufficient fertiliser remaining to supply all that is required by the cover crop. In the unlikely event of no manure having been given to the trees or vines, then a dressing of about 1cwt. of super to the acre sown would be necessary for the cover crop.

TURNING UNDER.

For this the single furrow plough with revolving coulter and drag-chain is favoured. A wide tyred land wheel will prove helpful in rolling down the strip for the next round. By this method the crop can be put out of sight. Should the soil be too dry for ploughing when the cover crop has reached maturity, it is advisable to merely disc the cover crop and plough later, but ploughing should be done not later than the end of July in order to avoid damage to the young root growth.

THE CASE FOR AND AGAINST COVER CROPS.

It is generally admitted that a well grown and luxuriant cover crop provides the cheapest and best method of providing nitrogen, keeps the soil in a good mechanical condition, activates bacteria, and maintains a supply of the so necessary humus. One might therefore think that these good results being so obvious, nothing could be advanced against the general and universal growing of Green Manure; however, there is another side to the picture. It has been assumed that the cover crop is to be planted with the last general irrigation, provision being made for one light special irrigation later on. In years of good rainfall, this will usually result in a satisfactory growth, but in dry years, such as the present, it will be found that the cover crop will wilt and go off unless additional water is supplied, and this is the "catch" in it. There is the problem of a rising water table to be faced and anything which tends to aggravate this trouble is to be most carefully avoided. It is fairly well realised the amount of good which results from a successful cover crop, but the amount of harm which may easily result from over-watering is not so apparent, because this surplus water, which is soaking down and so raising the water table being "out of sight," is with many settlers also "out of mind." If, therefore, the settler has to deal with a soil which will not grow cover crops with the light irrigations beyond which it is not safe to venture, then he will be well advised to seek some other method of supplying humus, such as stable manure, old lucerne, leaf mould, &c., rather than run the risk of ruining his land (or some other man's through the too abundant use of water. One some soils, doubtless providing ordinary care is exercised, cover crops are in every way excellent, but on other classes of soils the reverse may be the case, and this aspect of the matter should be carefully kept in view.

THE ECONOMIC VALUE OF AUSTRALIAN BIRDS.

[S. Sanders, Jun., Moorook.]

Few primary producers think seriously or give consideration to the value of our native birds. They are unpaid workers, despised and illtreated by most men on the land. The Crow, one of the most useful birds, is slaughtered and harassed because people will not listen to common sense. They have a fixed prejudice against the Crow because they know little or nothing about its habits or value. The Crow is the greatest enemy of the blowfly, as most of the food of the Crow is blowfly larva. What would the farmer do without a scavenger in his paddocks during the lambing season? No pastoralist or farmer could do the work as efficiently or as well as the Crow. The argument will be advanced that the Crow kills lambs; no doubt he does, but never by his own aid; the lamb was a weakling and would naturally die and become food for the larva of the blowfly. The blowfly pest is reputed to be costing Australia £4,000,000 a year. The Crow does steal a few eggs from farmers, and for the good reason that the farmers do not collect the eggs as they should. Most people look upon the Magpie as a good and useful bird and it is given some protection, but the Crow is a more useful bird and should be wholly protected.

The Mud Lark or Peewit is of great value to stockbreeders and to the whole community. Fruitgrowers should give this bird every encouragement to frequent the orchards, as snails and worms are food for these birds. In swampy country the snails that live in the fresh waters are the host of the fluke. The fluke in the South-East of South Australia has caused some concern. Herons frequent waterholes, creeks, and swampy lands, and also destroy the host of the fluke. Most stockowners know the damage fluke does to sheep. Cuckoos are great workers. The Pallid Cuckoo is a migratory bird and appears when the large hairy caterpillars are about and helps to keep them in check. The little Bronze Cuckoo is found when the small green caterpillar is about, and will be found in numbers feeding on the small green insects that are attacking the grass or herbage. The little Blue Wrens are of great value to the orchardist as their food consists of insects. The value of the little Red-capped Robins cannot be estimated; they have several broods of young in a season, and the number of insects they consume is untold. A great number of small green caterpillars that attack apricot tree foliage and fruit are consumed by these little birds, which are always busy.

There are several small birds, called by most people Tomtits, of the Linnet family. They are to be found in most orchards devouring small insects and helping to keep pests in check. There is one very useful bird that happens to come along at the correct time—the White Shouldered Caterpillar Eater. There is a green caterpillar that attacks lucerne at times and does a great deal of damage. The only food of these useful birds seems to be these caterpillars.

Quail are not very numerous along the river, but can be found in numbers at times. Where plentiful, they do a great deal to keep insect pests under control. The young of the Quail, between 6 and 14 in a brood, live on small insects and small seeds for a good part of their lives. The Sacred Kingfisher is a migratory bird and arrives just at the right time to be of great value to mankind and takes toll of a great number of caterpillars, especially worms.

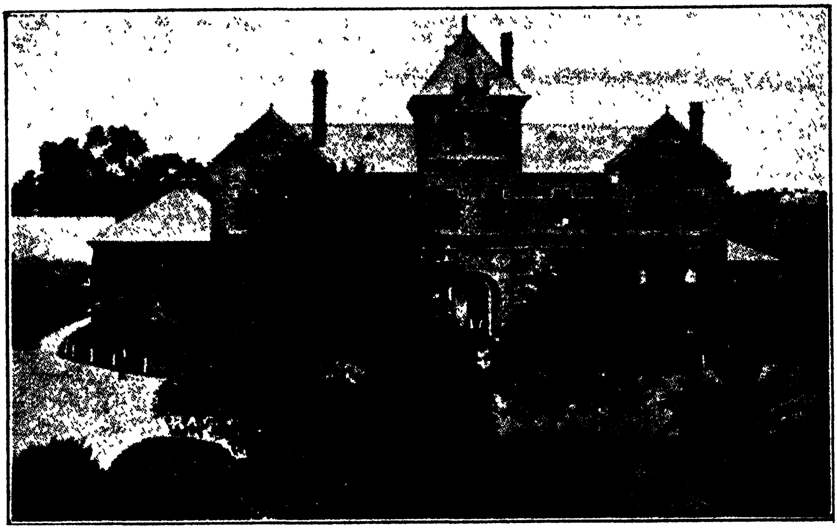
There are a great number of Hawks and Owls in South Australia. The Kestrel, often mistaken as an enemy, is an insect-eating bird, and is mistakenly called a Sparrow Hawk. The Owls keep up the battle with insects at night while other birds are resting. The House Swallow is one of the many birds that should be protected. Do not knock down the nests if they build under a verandah; place a piece of tin or iron under the nest to catch any droppings. It is estimated that a Swallow consumes about 2ozs. of insects a day, and these are all small flying insects. Small Bats should not be destroyed; they are enemies of the mosquito and live on small flying insects.

The large Wedge-tailed Eagle is being destroyed by thoughtless people. They are carrion-eaters and scavengers and help to clean up the filth that is left on pasture lands. They also clean up the offal that breeds the blowfly. Most of the native birds are of great economic value; they are unpaid workers which we cannot do without.

WHY IS THE CURRANT DETERIORATING?

[L. A. Chapple, Berri.]

It is not so much that the Currant has deteriorated as that the standard of packing is higher. This is to our credit. Still there are some things that can be attended to that will improve the quality of the Currants. Some soils produce better quality fruit than others, and it is always a well drained soil that produces the best fruit. It may vary from an old river silt bed to light sandy soil. Even the heavy red soils produce good Currants, but if the roots are oversupplied with water the growth of the vine is excessive and the fruit of inferior quality. This will often be the case at the top and bottom of the rows. Land that is affected with salt is not suitable for Currant growing, because the setting is affected, and the fruit produced will be small and not uniform. The growth on the Currant vine should be sturdy, but not wild, and anything that tends to produce such wild growth contributes to the lowering of the quality of the Currant, even though the crop is increased. An oversupply of nitrogenous manure is likely to bring about this effect, and for that reason it is probably the most difficult vine to which to apply manure. Much of the inferior quality of the Currant is brought about by faulty pruning. Sturdy growth is required to produce good bold fruit, and where weak spurs are left pruned to the same length as strong ones, the bunches produced from them must be of poorer quality. Nor is this the greatest fault in Currant pruning. Often every shoot that is produced is expected to carry fruit or is cut off so imperfectly as to cause weak, twiggy growth to spring from the base eyes that are left. Mr. A. V. Lyon, M.Sc. (Officer-in-charge Merbein Research Station) has proved that the quality of the Currant is improved by careful pruning and disbudding. Disbudding not only disposes of a lot of poor, weak bunches, but if practised for a few years the sap flow is more generally directed to the fruit spur. Care in picking will also improve the quality of Currants. In most vineyards there will be found patches that are ripe earlier than others; these should be picked out early and the fruit on the rack shaded. It does not pay to pick over vines. Either the fruit should all be picked or all be left. Fruit that is not ripe enough to pick early could be left, in most cases, until the Sultanas are finished. Currants are often dragged from the racks long before they are ready, and placed out in the hot sun to dry, so that room can be made for the Sultana crop. Such methods do not improve the quality of the fruit.



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ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, 31st July, there being present Messrs. A. J. Cooke (Chairman), R. H. Martin (Vice-Chairman) J. W. Sandford, Hon. A. L. McEwin, M.L.C., J. B. Murdoch, A. J. A. Koch, F. Coleman, P. J. Baily, H. N. Wicks, A. M. Dawkins, Geo. Jeffrey, Dr. A. E. V. Richardson, Professor A. J. Perkins, and H. C. Pritchard (Secretary).

An apology was received from Mr. S. Shepherd.

Election of Officers.—Mr. A. L. McEwin was elected Chairman and Mr. J. W. Sandford Vice-Chairman for the ensuing 12 months.

Re-appointment of Members.—Messrs. R. H. Martin, Geo. Jeffrey, J. B. Murdoch, J. W. Sandford, S. Shepherd, Hon. A. L. McEwin, M.L.C., and Dr. A. E. V. Richardson, who retired by effluxion of time on 30th June, were re-appointed by the Honourable the Minister of Agriculture for a further period of two years. The Minister also gave approval for the re-appointment of Mr. A. J. A. Koch as from 1st July, 1934.

New Branches.—Approval was given for the formation of a Men's and a Women's Branch at Karte, with the following as foundation members:—Men's Branch: C. G. Huckel, C. O. Patrick, H. W., C. B., and G. H. Trowbridge, C. H., E., G., and C. Atze, R. O. and C. W. Phillis, E. V., P. I., and B. J. Button, E. A. Huckel, I. A. Angus, E. B., L. M., and K. E. Franklin, H. G. R. Gould, D., D. C., and D. R. Freeman, A. H. Gum, A. M. Mason, M. E. Small, L. H. Frost, A. A. Bierwirth, D. R. F. Flavel, A. Mattschoss, L. Inglis, jun., F. Gregory, G. Furniss, C. W. Gum, A. L. Small, and D. Bierwirth. Women's Branch: Mrs. H. W. Trowbridge, Misses E. and D. Trowbridge, Mrs. A. Mattschoss, Mrs. R. O. Phillis, Mrs. P. I. Button, Miss P. Button, Mrs. D. R. Flavel, Miss B. Flavel, Mrs A. H. Gum, Miss Avis Gum, Mrs. A. A. Bierwirth, Miss F. Bierwirth, Mrs. H. Gould, Mrs. -- Inglis, Mrs. C. Inglis, Mrs. C. Furniss, Mrs. E. N. Atze, Miss E. Atze, Miss G. Fiebig, Miss M. Button, Mrs. E. B. Franklin, Mrs. C. G. Huckel, Misses J. and T. Huckel, Mrs. D. R. Freeman, Mrs. L. Small, Miss E. Small, Mrs. — Russell, Miss — Angus, Mrs. C. W. Gum.

New Members.—The following names were approved for addition to the rolls of existing Branches:—Arthurton—V. W. Rudd, Clinton Tribbeck, M. T. Hynes; Balaklava—B. Robinson, Clifford March; Balhannah Women's—Miss — Miller, Berri—W. H. Wilksch; Booleroo Centre—W. A. Mills, C. Patterson, W. Whibley, V. G. Whibley, R. W. Reichstein, T. H. Reichstein, J. J. McCarthy, W. Sismey, J. B. Heddle, A. H. Schmaal, R. W. Noblet; Brentwood—E. E. M. Twartz, J. J. Honner, A. T. Symonds; Brinkley—Joe M. Jones, Elliot Jones, Edgar Schubert; Chapman Bore—H. C. Price, W. A. Taylor, Dudley Krollig, G. H. Burbridge, J. I. Ellis; Clare Women's—Mrs. N. M. Penfold, Mrs. G. Victorsen, Mrs. C. A. Masters, Mrs. R. Michael; Coonalpyn—R. J. and A. T. Schottelius, William Barrie, C. Coles, H. Mincham, C. Limbert, C. Leonard, G. E. and E. W. Venning, Brice Russell; Cungena—Malcolm, Donald R., and S. H. Bennie, Murray Dickson; Echunga—Edgar Braendler; Jamestown—W. C. Glasson, James Gilfillan, M. W. Bailey, Norman Jamieson, J. Rundle, A. D. Mitchell; Kanni—W. T. Fudge, A. A. Koch, F. A. Hoad, R. T. Graetz, E. H. Schulze, J. Platten, jun., W. Gregory, H. A. Pobke; Kelly—V. E. Ball, L. L. Veinke, F J. Newman; Lameroo—Arthur H. Worsley; Lenswood and Forest Range, C. Mason, J. R. Shaw, C. Schultz; Maltee Women's—Miss R. Talbot, Miss D. Moody; Minnipa—L. Jefferson; Morchard—Gordon Irvine, Mervyn Twigden; Morchard Women's—Miss Laurel Davill, Misses Daphne, Ronda, and Edna Twigden; Mount Pleasant—C. M. Watson, D. Hobbs, W. Kubank, J. Staples, W. K. and F. V. Johns, R. Simmons, W. F. Holmes, L. R. Harding, A. L. and Reg. Starkey, E. H. Buckley, M. H. Tapscott, E. R. Wegener, C. E.

Boyce, Ross Hobbs, E. R. Staples, A. N. Meakins; Mudamuckla Women's—Miss Laurel Burner; Narridy—O. Smart, O. G. Roberts; Narridy Women's—Misses L. and V. Roberts, Mrs. E. A. Darley, Mrs. R. S. Darley, Mrs. C. Cox, Mrs. C. Duel, Miss E. Griffin, Miss E. O'Shaughnessy, Miss E. Cox, Miss E. Thredgold; Owen—D. J. Wilson, I. Williams. Paskeville—M. E. Bussenschutt; Pygery Women's—Mrs. E. N. Heath, Miss Isobel Heath, Mrs. E. Bean, Miss Amelia Bean, Mrs. R. W. Woodrup; Redhill—M. Murphy, J. Tieste; Rosedale—A. G. Muegge, M. Muegge; J. Ruediger; Saddleworth Women's—Mrs. C. H. Behn; Sandalwood—A. G. W. Grant, E. Jennings; Sheoak Log Women's—Miss Marjorie Wehr; Snowtown—G. S. Freebairn, C. R. Wills; Snowtown Women's—Mrs. A. M. Robinson; South Kilkerran—W. G. Hasting, E. H. R. Dutschke, A. Bittner; Stockport—H. C. Clayton, A. Stevens, F., L., R., and E. Koch; Taragoro—A. H. G. Price, Vincent Price, Wm. Thredgold, Joseph Edwards; Tailee—W. R. Kelly, L. Molineux; Warcowie—A. E. S. Dunstan, Warramboo Women's—Miss Laurel Chilman; Weavers—K. H. Giles, A. Farrow; Whitwarta—O. A. Ruediger, L., G., and B. Moldenhauer, F. Davies, H. R. Clark.

Branches to be Closed.—It was decided to close the Coulta, Bowhill, and Edillilie Branches through lack of interest.

Life Membership.—Approval was given for the appointment of the following persons as Life Members:—Messrs. S. V. Beckman, Parilla Well; W. J. Hammond, Taplan; H. Howard and T. B. Ness, Milang; and R. L. Myers, Mount Hope.

Several items were taken in Committee.

DRY, MATURED, FREE RUNNING.

WML
BEST ON EARTH

HIGH GRADE
45% SUPER.

SPECIFY IT ALWAYS.

MANUFACTURED BY
WALLAROO-MOUNT LYELL FERTILISERS, LIMITED,
Wallaroo and Port Adelaide.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING MAY AND JUNE, 1935.

IMPORTS.

Interstate.

	May.	June.
Apples (bushels)	1,084	635
Apples, Custard (bushels)	26½	8½
Bananas (bushels)	19,089	13,924½
Citrus—		
Grape Fruit (bushels)	61	23
Lemons (bushel)	1	—
Oranges (bushels)	77	5
Passion Fruit (bushels)	348	302
Paw Paws (bushels)	-	8
Pears (bushels)	-	14
Pineapples (bushels)	986	700½
Tomatoes (bushels)	1,160	—
Nuts—		
Chestnuts (bushel)	1	—
Cocoanuts (bags)	3	1
Peanuts (bags)	205	195
Peanut Kernels (bags)	60	142
Walnuts (bag)	—	1
Ginger (bushels)	3	---
Asparagus (packages)	2	2
Beans (bags)	7	180
Potatoes (bags)	2,946	5,998
Potatoes, Sweet (bushels)	19	11
Rhubarb (packages)	2	2

	May.	June.
Swedes (bags)	5	50
Bulbs (packages)	36	36
Plants, ornamental (pkgs.)	125	123
Roots, grass (bag)	1	—
Seeds (packages)	47	44
Trees, Fruit (packages)	18	54
Trees, ornamental (pkgs.)	10	12
Wine Casks (No.)	2,677	3,054
Fumigated—		
Citrus, oranges (bushels)	40	--
Plants, ornamental (pkgs.)	40	--
Trees, Fruit (packages)	18	39
Trees, ornamental (pkgs.)	8	4
Wine Casks (No.)	20	11
Rejected –		
Bananas (bushels)	12	27
Citrus, Grape Fruit (bushel)	1	—
Tomatoes (bushels)	15	--
Beans (bag)	1	--
Potatoes (bags)	160	—
Second-hand case (No.)	1	-

Overseas.

(State Law.)

	May.	June.
Wine Casks (No.)	908	1,560
Fumigated– Wine Casks (No.)	90	

Federal Quarantine Act.

	Packages.	lbs.	Packages.	lbs.
Seeds, &c.	5,114	889,270	1,242	141,272
Canes	227	—	71	—
Cocoanut Chests	810	—	323	–
Tea Chests	1,174	--	1,805	---
Fibre	257	90,477	432	172,135
Plants	2	83 (No.)	—	—
Timber	224,120	3,794,117 sup. ft.	143,355	3,742,116 sup. ft

EXPORTS.

Federal Commerce Act.

		May. Packages.	June. Packages.
England	Apples	22,299	4,418
	Citrus—		
	Oranges	—	20,333
	Pears	751	--
France	Citrus		
	Oranges	—	8
Germany	Citrus –		
	Oranges	—	9
India	Apples	2,768	1,702
	Citrus—		
	Oranges	45	121
	Pears	30	—
	†Vegetables	82	27
Netherlands East Indies	Apples	645	579
	Citrus—		
	Oranges	—	28
	†Vegetables	11	51

		May. Packages.	June. Packages.
New Zealand	Citrus—		
	Oranges	—	16,962
	Plants	2	15
	Seeds	48	—
Scotland	Citrus—		
	Oranges	—	4,346
Singapore	Apples	44	—
	Citrus—		
	Lemons	15	15
	Oranges	—	20
	Pears	166	195
	†Vegetables	148	117
Straits Settlements	Apples	100	—
	Potatoes	—	10
	†Vegetables	8	13

† Excluding potatoes.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co. Limited reported on 2nd August:—

Butter.—Conditions in South Australia through July were, generally speaking, satisfactory, but in the Northern areas and in the Mallee districts rain is still badly needed. Cream supplies increased each week during the month, but this was from the Hills and South-Eastern districts. It is pleasing to report that the London market steadily improved, and at date of report spot price for Australian choicest Kangaroo butter was 93s. per cwt. Local demand was well maintained and rates were unaltered, being:—Choicest creamery fresh butter in bulk, 1s. 2¾d.; prints and delivery extra. (This price is for local sale only and under the quota system the equalised price manufacturers will receive will be 12.3125d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines, from 8d. to 11½d. per lb. for choicest. Stores, 6d. to 8d. per lb. (these prices are subject to equalization levies).

Cheese.—Milk supplies received by the factories in the Mount Gambier district increased each week and the outlook for the season is more promising than it has been for many years past. Apart from supplying the local and Westralian markets, exporting to Britain is now proceeding and record quantities, it is expected, will be shipped. Rates are:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra. Semi-matured, 11d. to 11½d. per lb.

Eggs.—A very sudden increase in the supplies took place at the latter end of July and exporting, which had been temporarily suspended, was then resumed in earnest. It was therefore necessary to adjust prices to export parity and present rates are:—Ordinary country eggs, fair average quality, 7½d. per dozen net; long distance rail or shipping eggs lower. Selected new laid clean eggs, full-sized, 10d. to 11d. per dozen net.

Bacon.—Manufacturers kept the markets well supplied with bacon and steady winter trade has been maintained at:—Best quality sides, 9½d. to 9¾d. per lb.; middles, 10½d. to 11d.; heavy middles, 9d. to 9½d.; rolls, 8d. to 8½d.; hams, 1s. 1d. to 1s. 2d.; cooked, 1s. 2d. to 1s 4d per lb

Almonds.—Supplies received were barely sufficient to meet all trade requirements, and heavier quantities could have been placed. Values, however, have remained steady at:—Softshells and Brandis, 8½d. to 9½d. per lb.; hardshells, 5d. to 5¼d.; kernels, 1s. 9½d. to 1s. 10½d. per lb.

Honey.—Unfortunately there is no improvement to report in the selling market, and very heavy stocks are still held by merchants. Quotations are:—Prime quality clear extracted, 2¼d. to 2¾d. per lb.; lower grades, 1d. to 2d. per lb.

Beeswax met with strong demand at quotations:—1s. 4d. to 1s. 4½d. per lb. according to quality.

Potatoes.—New season's, 14s. per cwt.

Onions.—Brown Spanish, 12s. per cwt.

Live Poultry.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms, which are in every way the best equipped in South Australia. Supplies during the last few weeks showed improvement, and, where the birds were in good condition, a firming in prices was recorded. There was, however, a good demand for all grades. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. to 4s.; nice-conditioned cockerels, 2s. 6d. to 2s. 11d.; fair-conditioned cockerels, 2s. to 2s. 5d.; chickens lower. Heavyweight hens, 2s. 5d. to 3s.; medium hens, 2s. to 2s. 4d.; light hens, 1s. 7d. to 1s. 11d.; couple of pens of weedy sorts lower. Prime young Muscovy drakes, 3s. to 4s.; young Muscovy ducks, 2s. to 2s. 8d.; ordinary ducks, 1s. 3d. to 2s.; ducklings lower. Geese, 2s. 6d. to 3s. 6d.; goslings lower. Turkeys, good to prime condition, 7d. to 8d. per lb. live weight; do., fair condition, 5d. to 6½d. per lb. live weight; do., poor and crooked breasted lower. Pigeons, 5½d. each.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of July, 1935, also the average precipitation for July, and the average annual rainfall.

Station.	For July, 1935.	Av'ge. for July.	To end July, 1935.	Av'ge. Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·02	0·22	1·99	4·66
Marree	—	0·32	1·72	5·88
Farina..........	—	0·35	1·65	6·43
Copley	0·07	0·46	1·38	7·87
Beltana.........	0·04	0·55	1·43	8·48
Blinman	0·15	1·08	1·49	11·86
Hookina	0·07	1·17	1·98	11·25
Hawker	0·33	1·26	2·39	12·26
Wilson	0·25	1·20	2·55	11·79
Gordon	0·25	0·93	2·25	10·53
Quorn	0·47	1·43	2·83	13·22
Port Augusta....	0·15	0·72	4·34	9·44
Bruce	0·18	0·94	2·56	9·87
Hammond	0·13	1·04	3·25	11·21
Wilmington	0·79	2·02	5·20	17·32
Willowie	0·41	1·27	4·06	12·25
Melrose	1 29	2·83	9 90	22·88
Booleroo Centre	0·71	1·61	5·56	15·21
Port Germein ...	0·44	1·14	5·77	12·53
Wirrabara	1·14	2·36	7·06	19·29
Appila..........	0·84	1·54	7·25	14·65
Cradock	0 21	0·97	2·17	10·82
Carrieton	0·53	1·25	3·56	12·23
Johnburg	0·37	0·94	2·53	10·58
Eurelia	0 28	1·26	2·71	12·79
Orroroo..........	0·64	1·32	4·05	13·20
Nackara	0·35	0·98	3·24	11 09
Black Rock	0·69	1·18	3·51	12·37
Oodlawirra	0 43	1·05	3·24	11·68
Peterborough....	0·57	1·24	4·71	13·22
Yongala	0·86	1·45	5·88	14·44
NORTH-EAST.				
Yunta	0·07	0·58	2·71	8·55
Waukaringa	0·20	0·58	2·19	7·94
Mannahill	0 12	0·57	1·79	8·20
Cockburn	0·02	0·51	1·24	7·96
Broken Hill, N.S.W.	—	0·72	1·49	9·56
LOWER NORTH.				
Port Pirie	0·28	1·23	7·33	13·21
Port Broughton.	0 43	1·51	8·63	13·88
Bute	1·39	1·91	7·59	15·44
Laura	1·00	2·03	8·77	17·95
Caltowie	0·51	1·76	6·95	16·74
Jamestown......	0·95	2·02	7·80	17·69
Gladstone	0·62	1·80	8·14	16·29
Crystal Brook ...	0·49	1·66	9·74	15·78
Georgetown	0 67	2·04	8·60	18·37
Narridy	0·76	1·68	8·08	15·82
Redhill	1 24	1·87	10·23	16·59
Spalding	0·89	2·06	8·61	18·88
Gulnare	1·12	2·16	8·65	18·68
Yacka	0·92	1·71	8·63	15·39
Koolunga	0·75	1·73	7·98	15·38
Snowtown	1·29	1·74	8·13	15·74
LOWER NORTH—*continued*.				
Brinkworth	1·13	1·71	8·88	15·82
Blyth	1·23	1·83	10·53	16·78
Clare	1·88	3·07	12·94	24·51
Mintaro	1·96	2·83	12·58	23·42
Watervale	1·90	3·13	14·81	26·80
Auburn	2·24	2·97	13·32	23·98
Hoyleton	1·06	1·93	9·39	17·33
Balaklava.......	0·99	1·67	7·54	15·46
Port Wakefield ..	0·98	1·34	7·37	12·94
Terowie	0·57	1·31	4·43	13·35
Yarcowie	0·82	1·39	5·39	13·59
Hallett	0·94	1·84	8·17	16·46
Mount Bryan....	1·35	1·99	9·13	16·83
Kooringa	1·42	2·15	8·20	17·85
Farrell's Flat ...	1·74	2·14	9·33	18·61
WEST OF MURRAY RANGE.				
Manoora	1·91	2·11	10·33	18·92
Saddleworth	2·11	2·23	10·72	19·60
Marrabel........	1·96	2·31	10·64	19·96
Riverton........	2·30	2·39	12·18	20·81
Tarlee	1·75	1·94	8·95	18·10
Stockport	1·75	1·80	10·00	16·93
Hamley Bridge .	1·47	1·77	8·78	16·54
Kapunda	1·47	2·30	8·55	19·79
Freeling	1·66	1·98	10·08	17·83
Greenock	1·98	2·49	10·93	21·53
Truro	1·67	2·32	9·19	19·89
Stockwell	1·98	2·32	10·07	20·13
Nuriootpa	2·42	2·47	12·56	20·72
Angaston	2·23	2·70	10·38	22·42
Tanunda........	2·45	2·62	12·95	22·02
Lyndoch	2·51	2·96	12·48	23·40
Williamstown ...	2·78	3·65	13·57	27·77
ADELAIDE PLAINS.				
Owen	1·06	1·65	8·82	14·66
Mallala	1·47	1·81	7·54	16·56
Roseworthy	1·78	1·94	9·74	17·40
Gawler	2·20	2·18	9·66	18·91
Two Wells	2·39	1·81	11·94	15·75
Virginia	1·93	1·93	10·09	17·18
Smithfield	1·90	1·97	10·16	17·64
Salisbury	2·08	2·09	10·68	18·56
Adelaide	2·58	2·64	12·76	21·15
Glen Osmond....	3·34	3·36	14·53	26·05
Magill	3·31	3·12	14·04	25·53
MOUNT LOFTY RANGES.				
Teatree Gully ...	3·27	3·17	15·19	27·20
Stirling West ...	7·75	6·21	31·04	47·08
Uraidla	6·15	5·89	15·65	44·19
Clarendon.......	4·16	4·23	18·81	23·88
Happy Val'y Res.	3·88	—	15·14	—
Morphett Vale ..	2·88	2·88	13·21	22·66
Noarlunga	2·79	2·69	12·39	20·37
Willunga	3·73	3·60	15·08	26·02
Aldinga.........	2·81	2·68	11·43	20·27

RAINFALL—*continued.*

Station.	For July, 1935.	Av'ge. for July.	To end July, 1935.	Av'ge. Annual Rain-fall.
Mount Lofty Ranges—*continued.*				
Myponga	5·85	4·34	22·81	29·50
Inman Valley	5·15	—	19·67	—
Yankalilla	4·33	3·09	13·10	22·83
Mount Compass	5·95	—	—	—
Mount Pleasant	4·08	3·56	14·73	27·23
Birdwood	4·35	3·85	16·23	29·21
Gumeracha	4·92	4·25	18·75	33·41
Millbrook Res.	4·88	4·42	21·16	34·68
Tweedvale	6·61	4·91	22·43	35·99
Woodside	5·06	4·28	18·98	32·31
Ambleside	6·20	4·64	21·37	34·90
Nairne	4·32	3·68	16·25	28·22
Mount Barker	4·77	4·22	17·50	31·31
Echunga	4·69	4·20	19·95	33·30
Macclesfield	4·82	4·00	17·34	30·43
Meadows	5·63	4·72	20·45	36·16
Strathalbyn	2·84	2·49	10·28	19·31
Murray Fats and Valley				
Meningie	1·76	2·35	9·77	18·37
Milang	1·36	1·80	7·05	14·91
Langhorne's Ck.	1·81	1·71	8·06	14·87
Wellington	1·62	1·47	8·42	14 65
Tailem Bend	1·58	1·48	8·58	15·06
Murray Bridge	1·32	1·36	6·31	13·56
Callington	1·65	1·73	6·42	15·19
Mannum	1·10	1·13	5·91	11·49
Palmer	2·62	1·73	8·12	15·63
Sedan	1 33	1·17	4·82	12·11
Swan Reach	1·15	0·90	4·71	10·64
Blanchetown	0·75	0·89	3·90	11·01
Eudunda	1·96	1·86	9·79	17·17
Pt. Pass	2·01	1·84	9·46	—
Sutherlands	0·74	1·01	3·84	10·84
Morgan	0·42	0·70	3·39	9·17
Waikerie	0·54	0·70	4·17	9·65
Overland Corner	0·40	0·77	3·08	10·32
Loxton	0·67	0·93	3·90	11·54
Berri	0·87	0·81	4·93	10·17
Renmark	0·72	0·78	5·17	10·41
West of Spencer's Gulf				
Eucla	2·17	0·88	8·85	9·96
Nullarbor	1·03	0·96	5·18	8·81
Fowler's Bay	1·72	1·72	7·82	11·94
Penong	1·09	1·71	6·47	12·27
Koonibba	0·64	1·63	6·74	12·13
Denial Bay	0·77	1·54	5·88	11·36
Ceduna	0·82	1·30	6·47	10·16
Smoky Bay	0·82	1·54	6·28	10·53
Wirrulla	1·02	1·35	8·11	10·54
Streaky Bay	2·46	2·33	11·24	14·88
Chandada	1·44	1·98	8·13	—
Minnipa	1·57	1·82	8·01	14·06
Kyancutta	1·63	1·76	8·99	—
Talia	2·61	2·31	9·69	14·76
Port Elliston	1·91	2 63	11·59	16·54
Lock	2·12	2·24	9·81	16·52
Mount Hope	3·42	—	13·67	—
Yeelanna	2·90	2·50	13·14	15·94
Cummins	3·03	2·85	12·84	17·60
Port Lincoln	1·94	2·99	9·84	19·42
Tumby	2·23	1·95	8·30	14·12
Ungarra	2·56	2·42	10·38	16·85
Port Neill	1·57	1·51	7·36	13·09
West of Spencer's Gulf—*continued.*				
Arno Bay	1·66	1·47	8·09	12·65
Rudall	1·55	1 61	8·96	12·64
Cleve	2·06	1·67	10·64	14·83
Cowell	0·45	1 02	4·83	11·07
Miltalie	1·03	1·36	9·11	13·67
Mangalo	1·26	1·56	7·90	13·91
Darke's Peak	1·90	1·78	10·46	15·18
Kimba	1·16	1·40	7·34	11·82
Yorke Peninsula.				
Wallaroo	0·80	1·57	8·47	13·98
Kadina	1·24	1·92	9·77	15·64
Moonta	1·36	1 84	8·10	15·06
Paskeville	1·32	1·87	8·06	15·49
Maitland	2 24	2·51	11·99	19·90
Ardrossan	1·81	1·54	8·00	13·97
Port Victoria	1·16	1·89	8·15	15·44
Curramulka	2 09	2·35	8·75	17·87
Minlaton	2·01	2·30	9·00	17·79
Port Vincent	1·64	1·70	6·76	14·43
Brentwood	2·07	2·04	9·38	15·55
Stansbury	2·92	2·18	8·89	16·82
Warooka	2·55	2·59	9·59	17·49
Yorketown	3·00	2·30	11·93	16·88
Edithburgh	3·07	2·13	9·61	16·37
South and South-East.				
Cape Borda	5·29	4·18	19·54	24·82
Kingscote	4·66	2·99	14·06	19·14
Penneshaw	3·02	2·95	11·89	18·92
Victor Harbour	2·97	2·93	12·31	21·37
Port Elliot	2·22	2·62	9·81	19·93
Goolwa	1·91	2·32	8·71	17·85
Maggea	0·94	0·91	4·64	10·04
Copeville	1·22	0·93	6·12	11·51
Claypans	1·13	0·94	5·15	10·38
Meribah	1·01	1·09	5·03	11·31
Alawoona	0·97	1·03	4·67	10·36
Caliph	0·77	0·87	4·37	—
Mindarie	1·12	1·08	5·18	12·21
Sandalwood	1·46	1 28	6·85	13·66
Karoonda	1·54	1·25	7·56	14·36
Pinnaroo	1·15	1·33	4·74	14·43
Parilla	1·50	1·31	6 44	13·82
Lameroo	1·61	1·60	6·77	15·97
Parrakie	1·88	1·41	8·89	14·62
Geranium	1·94	1·71	9·57	16·51
Peake	2 32	1·60	10·31	16·01
Cooke's Plains	1·44	1·65	8·62	15·30
Coomandook	1·73	1·99	9·42	17·09
Coonalpyn	2·15	2·09	10·84	17·61
Tintinara	2·46	2·16	11·45	18·71
Keith	3·15	2·08	10·90	17·92
Bordertown	3·15	2·24	11·50	19·21
Wolseley	3·14	2·10	11·01	18·49
Frances	3·70	2·36	13·73	20·11
Naracoorte	3·78	2·77	15·59	22·66
Penola	3·64	3 27	15·24	26·01
Lucindale	4 77	3·26	18·61	23·34
Kingston	4·78	3·52	16·40	24·28
Robe	4·43	3·96	18·19	24·67
Beachport	5·90	4·43	20·17	27·09
Millicent	6·12	4·32	22·63	29·79
Kalangadoo	5·24	4·47	19·51	32·28
Mount Gambier	4·39	4·06	16·74	30·45

AGRICULTURAL BUREAU REPORTS.

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* No report received during the month of July.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

SUBJECTS DISCUSSED AT BUREAU MEETINGS.

If you have no other subject in mind, here is a list from which you might choose when asked to contribute to your branch programme. The list has been compiled from published branch reports.

Agriculture.

- Barley Growing.
- Harvest Reports.
- Pasture Management.
- Fallowing.
- Care of Machinery.
- Control of Drift.
- Fodder Crops.
- Haymaking.
- Crop Rotation.
- Seeding Operations.
- Wheat Pickling.
- Wheat Diseases.
- Wheat Varieties for the District.
- Seed Wheat.
- Value of the Oat Crop.
- Wheats for Milling.
- Peas.
- Wheat *v.* Sheep.
- Wheat Varieties for Hay.
- Crop Competitions.
- Harvest Operations.
- Value of Agricultural Experiments.
- Cultivation.
- Fertilisers and Manures.
- Cultivator *v.* Plough for Fallowing.
- Tobacco Culture
- Meadow Hay.
- Review of the Past Season.

Horticulture.

- Cincturing.
- Spraying.
- Pruning.
- Orchard and Garden Pests.
- Fruit Drying.
- Drainage.
- Potatoes.
- Tomato Culture.
- Vegetable Growing.
- Citrus Culture.
- Packing and Grading Fruit.
- Budding and Grafting.
- Orchard Cultivation.
- Rack Building.
- Fruit Preserving.
- Irrigation.
- Seepage.
- Care of Orchard Equipment.
- Farm Garden.
- Diseases of the Vine.
- Manures for the Orchard.
- Fruit Tree Diseases.
- Planting the Orchard.
- Frost Prevention.
- Fumigation for Scale Insects.

Livestock.

- Calf Rearing.
- Care of Farm Livestock.
- Management of Horses.
- The Brood Mare.
- Colt Breaking.
- Shoeing Horses.
- Sore Shoulders.
- Weaning Foals.
- Lamb Marking.
- Sheep Management.
- Wool Classing.
- Shearing.
- Sheep Dipping.
- Fat Lambs.
- Handfeeding Sheep.
- Poultry.
- Shelter for Livestock.
- Management of the Dairy Cow.
- Care of the Breeding Ewe.
- Pigbreeding and Management.
- Ailments and Diseases of Farm Stock.
- Sheep *v.* Wheat.
- Rearing Turkeys.
- Horse Breeding.
- Herd Testing.
- Rams for Farm Flocks.

General.

- Afforestation.
- Beekeeping.
- Bird Pests.
- Blacksmithing.
- Book-keeping.
- Preparations for Drought.
- Ensilage.
- Labor Saving Hints.
- Fencing.
- Fodder Conservation.
- Vermin Destruction.
- Care of Hides and Skins.
- Farm Insurance.
- Tank Building.
- Shed Construction.
- Farm Conveniences.
- Concrete on the Farm.
- Dam Sinking.
- Scrub Farm Operations.
- Farm Sidelines.
- Bacon Curing.
- Value of Native Birds.
- Noxious Weeds.
- The Agricultural Bureau.
- Handling Dairy Produce.
- Farm Buildings.
- Layout of the Farm.
- Firefighting.
- Lowering Costs of Production.
- Farm Records.
- Subdivision of the Farm.

THE MILLING QUALITIES OF WHEATS.

The above was the subject of a paper by Mr. F. K. Parsons read at a meeting of Kelly Agricultural Bureau on 6th July, 1935, at which 26 members and visitors were present:—

Flour strength may be defined as the capacity of a flour for yielding a loaf of easily digestible bread, light and even in texture, composed of a network of uniform small holes, large in volume, well and evenly piled. A weak flour may make bread that will scarcely rise at all, a loaf flat, sodden, hard, indigestible and unmarketable.

During the process of baking the following, roughly, takes place:—Yeast feeds upon the sugar of the flour and multiplies, forming minute bubbles of carbon dioxide (CO_2) and small quantities of alcohol. The carbon dioxide and alcohol expand rapidly with heat.

The gluten and flour stretch like fine rubber and give the characteristic of the loaf. Strong flour wheats are generally high in gluten content, are hard, translucent, thin-skinned, and the flour absorbs more water than weak flour to bring it to the consistency of dough. Weak flour wheats are opaque, soft, mealy when crushed, low in gluten and water absorbtion.

Common Tests for Strength of Wheat for Flour:—

A. Translucent and hard grain.—By light and by biting.

B. Chewing test.—By chewing a few grains, the flour and bran can be dissolved, and the gluten is left. Thus the gluten can be roughly estimated. It resembles chewing gum or rubber.

C. The Pelshenke or Wholemeal Fermentation Test.—This test consists of grinding a few grains of wheat. To this wholemeal is added a 10 per cent. solution of yeast. This is mixed into a ball and placed in water at 31° C. The ball sinks; as gas is evolved by the action of yeast, it rises and expands, finally ruptures, and falls to the bottom. The time in minutes from when the ball was placed in water until it breaks is known as the Pelshenke test figure. The higher the figure the better the flour. This test is not strictly reliable. It is used by plant breeders mainly in eliminating weak floured wheats. The most definite test is by baking. Given quantities of flour are mixed and baked under similar conditions. The weight and volume of the loaves are measured, and the baking score, determined by marks, awarded for general appearance, colour of crumb, flavour, texture, and pile.

The reasons for so much prominence being given of late to quality in wheat are many. In an analysis of the Adelaide Show wheats of 1934 the Department of Chemistry published some figures. Two examples are quoted: Florence, a medium-floured; and Gallipoli, a weak-floured wheat:—

	Baking Score, Total 90 Marks.	Pelshenke Test No.	Vol.	Weight of Loaf.	No. of Loaves per Ton Flour, 14% Moisture.
Florence	42	76	390	136.9	1,369
Gallipoli	31	27	330	126.2	1,262
			60		107

Not only does Florence yield more loaves per ton but they are bigger and have a much better appearance than Gallipoli. Local millers take approximately one-fifth of the total Australian production, or 31,000,000bush. They are universally demanding better quality wheat. Some are giving up to 10d. per bushel more (in Western Australia) for desirable varieties.

The Export Trade.—A steady rise in the amount of export flour is taking place. This will be a valuable means of selling South Australian wheat, especially with the East. The U.S.A. and Canadian wheats are high in gluten. Flour of poor and varying quality is of no use on Eastern markets. The demand is there for Australian wheat and growers should endeavour to give them high gluten and good quality wheat. Egypt has passed legislation that all imported flour should have at least 12 per cent. gluten. Australian wheat is no longer in such strong demand for blending on account of its brilliant colour and dryness as this can be achieved by bleaching. In certain countries, *i.e.*, Tasmania, weak flour wheats can only be grown. These are very late in maturing and have soft, mealy grain. The flour is used for the biscuit and pastry trade. Mechanical mixing of dough is now universally accepted, and better quality is necessary to stand up to this mixing.

To Increase Flour Strength.—There are roughly three ways by which this can be done —(*a*) grow high flour strength wheats; (*b*) cross present wheats with strong flour wheats; and (*c*) select strong wheats from varieties that are good yielders, but have not been definitely fixed. The strong flour wheats are said to be lower yielding than weak flour wheat. However, at Roseworthy in 1928 Florence beat Nabawa by over 1bush. of wheat and 6cwts. of hay per acre. Better floured wheats, as decided by the Pelshenke test, that may suit this district are—Aussie 117, Felix 92, Florence 86, Ford, Sword (irregular test), Merredin, and Rance.

Crossing wheats to produce quality and yield will be a difficult and hazardous operation. It will also take a long time. The possibility of selecting for quality within a variety that is showing morphological variations such as Sword, Ford, and Nabawa seems hopeful. Ninety consecutive single plants of Sword, Ford, and Nabawa were harvested from pure seed rows. Plants were threshed in a single plant thresher, and the Pelshenke test was used to assess the baking quality of each single plant.

Nabawa.—The majority of plants gave figures between 28-66 minutes, average 40. However, two samples gave test figures of 90 and 132 minutes, and in doing so exhibited all the characters of a strong wheat.

Sword.—Plants ranged from 32 to 72 minutes, with an average of 46. Samples with a test figure of more than 50 minutes generally exhibited all the characters of a wheat of medium strength. It is unlikely that a variation of this magnitude would be shown by a pure line. It is interesting to note that the lowest and highest figures of plants of this variety—viz., 32 and 72—are similar to the test figure given by the parents of Sword, namely, Sultan and Ford.

Ford.—Plants from a pure seed row ranged from 42 to 80, average 60.

All States in Australia and Argentine, also in Europe, are trying to improve the baking quality of their wheat. In Western Australia the area under Gluclub was 300,000 acres. The Department is doing its best to discourage farmers from growing it.

In a paper read at the Lower North Conference, Mr. Marshman said:—"The President of Federal Millers' Association of the Victorian Wheatgrowers Co-operative Limited complained bitterly of the low quality wheat. They said it was really unsalable in British markets." Also a Melbourne bank manager said "We are up against trouble with wheat quality following denouncement by the millers of 'Free Gallipoli' wheat for milling purposes. The matter is really a serious one, and millers next year may decline to buy Free Gallipoli, and may pay 6d. per bushel below normal for it."

In wheat breeding, varieties are being discarded that do not show sufficient quality, no matter what yielding ability they possess. The varieties that are the worst offenders are Free Gallipoli, Nabawa, Gluclub, Early Gluyas, Waratah, Ghurka, and Penny; also many others that don't interest us. There is no need for growers to be stampeded into sowing untried varieties. Australian wheats are not greatly below world standards. (Secretary, F. R. Illman.)

SELECTION AND CARE OF WHEAT.

At a meeting of the South Kilkerran Branch on 1st July, Mr. E. F. Heinrich read the following paper, entitled "Selection and Care of Wheat"

Taking selection firstly, seed selected should suit the class of land in which it is to be sown. For feed purposes, the type of seed sown should be selected to suit the locality, and care should be taken even in these lines.

Types of wheat which "go down" are more or less unsuitable for heavy, wet soils, and wheats which are suitable for these soils are very often unsuitable for lighter land. For example, a paddock which is low-lying or heavy should not be sown with a wheat such as "King's White." A seed like this might yield well, but if a wet season is encountered the yield in money, if not in grain, is greatly reduced by the difficulty met with in reaping.

To a certain degree most wheats which thrive on heavy land, also rank amongst the best yielders on light soils. When procuring fresh seed from some other source, select from a crop which is not contaminated with barley or with weeds which are difficult to eradicate from the seed—either in reaping or in subsequent cleaning for drilling. Most weeds, and even barley, by the careful use of a suitable grader and separator can be culled from seed wheats, leaving it comparatively free from anything but the true grain. The presence of foreign wheats is an even worse evil, as these cannot be culled by grading, or—up to date—by anything short of hand picking, which is very slow, tedious, and expensive. It might also be added here that wheats of poor milling quality will have to be dropped if we wish to keep the quality of Australian wheats up to standard. The names of some of these wheats appeared in a recent daily paper. A step in the right direction has been taken by the millers in offering a prize for crops excluding those of poor milling qualities.

Further steps will have to be taken by legislation on price ruling to reduce the quantity of these wheats sown, as some of them, whilst they bring the same price as wheats of better milling quality, are profitable yielders.

Passing on to barley and oats, these also need selection. Owing to the efforts of the Bureau, coupled with the aid of interested farmers, we now have a very good type of barley seed—the Challenger Early, which is still comparatively free of Cape or other foreigners. This seed seems admirably suited to both maltsters and growers. Oats also repay selection, both for type suited to different conditions of land and for purity. Very seldom is seen a crop of oats free of Cape Barley and it would seem that to get pure oaten seed one would have to hand-pick a small plot and take pains in reaping so as to keep it pure.

When pure seed of a desirable type is unprocurable the thing to do is to hand-pick a strip of harvester width, or more if desired, and sow the results the following year with seed saved from the same variety, but separately or marked or in the centre of the piece, the result of that being saved for seed, again hand-picking a strip or more to purify that which will be reaped for seed the following year. A year or two of this will result in a pure type. Too much cannot be said about the care of the seed. Most varieties of seed should be pickled thoroughly to prevent smut, either by dry pickle (in wheat) or by a suitable solution such as formalin or blue stone of the correct strength. The strength recommended by the makers of the pickle is fairly accurate and should be adhered to with discretion. In using dry pickle, an effective pickler, which thoroughly dusts every grain should be used. For wet pickling use a method and quantity which thoroughly wets every grain. With one make of wet pickler on the market, every grain must drop through the water into a submerged worm which churns the grain up through the water into the bag. This is an ideal method, as if a grain is not thoroughly moistened on the surface it cannot drop to the elevating worm, and hence there are no dry spots left on the grain.

Too much care cannot be exercised in the pickling of barley, which is very subject to smut. Care amounting almost to fastidiousness should be exercised in cleaning the drill or combine when changing from one variety of seed to another. Every possible grain of the previously sown wheat should be removed both from the outside and the inside of the grain box before starting the next variety. Care should also be taken to keep grain from entering the fertilizing box, as this might stay in there indefinitely, and so contaminate the subsequent seed. In cleaning the grain box all grains near the top should be scratched into the cups, which should be then turned out by hand or run out over the plot just finished. There is always some grain which works into the closed cup as well as into the crevices between the two cups in which the lids fit (or misfit). These should all be scratched into the bottom of the cups before the final running or turning out.

Is it not well worth while spending the necessary small amount of time in this cleaning, and so keep the varieties pure? Combine and drill manufacturers could help a great deal in this matter by making the grain box a good deal easier to clean, and making the lids of the respective boxes so that they will not leak grain either over the frame and sections where the grain can lodge, or into the fertilizer box.

When reaping, harvesting machinery should be cleaned externally of other grain some time before the seed is to be saved. The machine, just before the saving of seed should be run some distance empty, with the bottom of the elevators opened. The grain box should be then well cleaned of all grain, and subsequent seed saved should be put in clean bags, not essentially new. Care should be taken that bag sowers do not take left-over butts from another kind of wheat, or even from the first heaps of the piece to the seed heaps.

Seed bags should be carefully marked when carted in, and again after cleaning. Grader, winnowers, &c., cannot be too carefully cleaned at the finish of each variety. It would be almost impossible to exercise too much care with seed, from the cleaning of seed until reaping of same for the following year, and it is this care that makes for clean, well-kept varieties of grain. (Secretary, R. E. Hasting.)

CULTIVATION FOR WHEATGROWING.

The above was the subject of a paper read by Mr. D. R. Wright at the monthly meeting of the Nelshaby Branch on 25th April. He advised commencing the fallowing early in June, and finishing before the end of July. Ploughing not more than 4in. deep had proved successful of late years, but in wet seasons a deep stirring would be of advantage. Deep working was only of use if done early, so if fallowing late in the season shallow working was advisable. Although the district was outside of "Goyder's Line of Rainfall," the lighter soils received an ample average rainfall for wheatgrowing requirements. Conservation of moisture was certainly necessary to bring fallows to a good mechanical condition, but with the local self-mulching soils it was not so important as the clearing of the fallows and the firming of the underlayers. Land ploughed and left uncultivated until after harvest was not fallow, although some farmers believed it was so. Frequent working with the harrows or tyned implements should be given at opportune times to kill weeds and to compact the seedbed. Disc implements, except for fallowing, were not conducive to good cultivation, because the soil was left too open and loose. There was no better implement than the combine drill; it cultivated and firmed the seedbed, and could be set to do a good job at a shallow depth. The use of a roller or culti-packer would be of advantage, especially where frequent cultivation could not be given to the fallow; wherever land was consolidated a better crop was always noticeable. Every working of the land paid for itself, and the farmer who gave his fallow from 5 to 6 workings in a year would find wheatgrowing a much more profitable proposition than the man who fallowed his land late and worked it little. (Secretary, J. A. Lawrie.)

SEEDING AND TYPES OF MACHINES.

Mr. H. B. East, in the course of a paper read at a meeting of the Boors Plains Branch on 6th June, said:—

The first object in fallowing should be to plough the field to a depth suitable for the soil in the district. Ploughing does two things; it not only breaks up the soil for finer tilling operations, it also breaks up those millions of capillary tubes so to speak, prevents the capillary action of moisture coming to the surface and being absorbed by the sun. Having stopped this capillary action it is now necessary to keep working the top soil in order to prevent the capillary action from reinstating itself. Two benefits are obtained from keeping the top soil in a fine tilth; the first is that this fine soil is like placing a bag or blanket over the capillary tubes preventing the sun from evaporating the moisture; the other benefit is that the dryness of the top surface tilth is attracting or drawing the moisture towards itself and thereby keeping the seedbed more damp than would be otherwise the case; or in other words it counter attracts the moisture going down into the earth or what is known as the process of percolation. Now these subsequent workings are of the utmost importance, as it is by working back the fallow after rain that we conserve the moisture to the point which is later to become the seedbed of the plant to be sown. Therefore the process of cultivating is to break the capillary tubes and cork them by working a fine mulch over the seedbed, and thus conserve the moisture; so that when the seeding commences we will take off the blanket and insert the seed as best we possibly can, so that every grain that is planted will yield several healthy stalks each with large plump heads of grain; and it is to this point I wish now to direct attention most.

It has always been the aim of a designer of a combine to create a grain sowing and cultivating machine which would cause 3 grain plants to be grown where only 1 or 2 grew before, and thereby assist the farmer to reduce the cost of producing the bushel of wheat, not by increasing the number of acres sown, but by increasing the number of bushels grown on each acre. At the same time the implement must do its work quickly and with the minimum of power, so as not to increase the cost in that direction.

On sowing grain on well prepared land the first essential is to place the seed evenly on the solidified bottom of the seedbed made by the share of the machine. The second is to space each grain as near as possible to a given distance from each other. For it must be remembered each grain becomes a plant, and on each plant there should be many stalks which become straw bearing ears filled with grain. If a number of grains are placed in close proximity to each other they rob each other of nutriment and become weak and do not develop to the fullest extent. When this error in sowing happens there is always a space where there are no grains—sometimes many inches long in the rows. This piece of soil is wasted and will grow weeds only. If the grain is placed evenly each plant has its own little dominion from which to draw nutriment, and becomes a strong, healthy plant with many straws having large full ears and plump grain.

The third essential is that every grain must have a thin layer of finely pulverised soil over it. The layer should be about ¾in. to 1in. thick, and the reason why it must be finely pulverised is that drying air is kept out and moisture retained so that the young plant can readily reach the light of day. If a grain is placed on the seedbed and a clod of hard soil is placed over it, the young plant will seldom find its way to the surface, but will perish and become lost. With a machine that does not pulverise the soil there are many thousands of grains lost in this way on every acre. Therefore in this respect a solid tyne machine sowing on the rear tynes has many advantages over a spring tyne, as the tyne and share are always at the correct set and dip and cut the correct width with the minimum amount of draught, because it always maintains the set the makers have put on and does not vary according to the nature of the soil. It will place both seed and fertilizer right on the seedbed under the share, and a glance at the share and boot will show this. The forward curve in the boot near the lower end projects the seed and fertilizer well forward, and the fine soil pouring back over the heel of the share immediately covers them. If the tyne were standing on a hard floor and a few grains dropped in the top of the boot, they would probably bounce out from under the share, but this cannot happen when the machine is working in the soil, because it is covered too quickly by the soil coming over the heel of the share.

No doubt many farmers have had trouble with grass roots dragging around the tyne over the heel of the share and preventing the seed from reaching the soil or seedbed. This is very obvious on all spring tyne combines with their present design of share and boot, and with this type of machine very little if any of the grain and super reach the seedbed. It is all suspended in the pulverised soil and covered by what is termed the covering tyne, which is the rear row of tynes. This applies more particularly to machines using the centre row for sowing, which is incorrect, as it sows first and cultivates afterwards. The seed is sown by the two centre rows 7in. apart, and a tyne of the rear row comes along within 3½in. and any grain of seed that may have found its way on to the seedbed is disturbed by the wing of the rear share and pushed up near the surface and remains suspended in the pulverised soil.

The net result of that type of sowing is that the seed and fertilizer are under a small mound or ridge of soil, but not right down on the seedbed. Usually they are from half to two-thirds, between the top and the seedbed. Should a day of warm dry wind occur within five or six days after sowing, the result would be very detrimental to the crop. The dry wind takes every particle of moisture out of the ridges or mounds; if the soil was liable to drift, the mound would drift into the small furrows or depressions on either side of the ridge and leave the seed uncovered. If the seed has commenced to grow and the young tender plant and root has left the grain the plant would perish in a very short time. If the ridge did not drift the moisture would evaporate and the young plant would have a hard time until rain came, because the tiny root would not have had time to establish itself in the solid seedbed, where the moisture holds for weeks after it has gone out of the pulverised soil.

With the solid tyne and back row sowing together with a latest type of boot the difficulties mentioned are overcome. The two front rows of shares do the primary work of cultivating, and the two rear rows do the secondary cultivating and the sowing. The finished result is alternate shallow furrows and hoe ridges of equal distance apart. The seed and fertilizer in this case are under the furrow with a thin layer of pulverised soil over them, not under the ridge as in the case with centre row sowing. The seed being placed on the damp, solid bottom of the furrow, germination will commence almost immediately with the help of the moisture and warmth of the fertilizer. When the root leaves the grain it will grow straight down into the soil and will quickly establish itself, and the young plant will quickly find its way through the layer of fine mulch to the light.

Should a dry wind and drought come, the young plant will not come to any harm for many days because the root is established in damp soil under the mulch where the moisture cannot so quickly escape. Should drift commence it cannot interfere with the plant. It would only lodge around the young plant, but would not uncover it. It may at first seem a trivial matter to mention a few drops of moisture on a grain field, but it is a very important subject.

The successful dry farmer is the one who endeavours to capture, conserve, and utilise every particle of moisture that falls throughout the year; therefore the designer of machines must design with that object in mind, as it is under dry seeding conditions that these small but important points prove that they correctly overcome many disadvantages so often proclaimed against combines in favour of the ordinary hoe drill. (Secretary, S. G. Chynoweth.)

REDUCING COSTS OF PRODUCTION.

At the monthly meeting of the Taragoro Branch 11 members were present from the Roberts and Verran Branch. The subject of the meeting was a paper by Mr. A. T. Cowley, of the latter Branch. He mentioned that the obvious way of reducing costs of production was by reducing the cost of farm requirements, but that was beyond the farmer's control. It remained only for the farmer to follow the oft-repeated advice to take care of all articles used in the production of farm products, and so lessen costs of repairs and replacements. There often arose the question of whether it was more important to push on with the work in hand with an implement out of repair and becoming more so every day, or to lose time by stopping work and overhauling it. The farmer needed to think carefully to decide which of the two evils was likely to prove the least costly in the long run. In some cases the rapid completion of the work would compensate for the inefficiency of the implement and the damage caused to it by neglect, but most often the ultimate cost of repairs, coupled with the loss due to the poor work done by an implement out of repair, would occasion the much greater loss. In viewing the subject from another angle, ploughing could be taken as an example. Ploughing was the heaviest, slowest, and most power-consuming of all forms of cultivation. To produce the greatest possible return from a piece of land after one ploughing might therefore be said to reduce the cost of ploughing to a minimum. If instead of re-ploughing after a first crop, a second crop almost as good as the first could be produced with but a light cultivation, something would be gained. If that gain could be sustained by producing yet another crop of a different kind or by securing grazing as good as if the land had been ploughed twice instead of only once, then the cost of producing the crops and grazing had been reduced by the amount represented by the difference between the cost of the light cultivation and the cost of repeated ploughings. If, on the other hand, the yield of the crop or grazing had been lowered to an extent representing more than the extra cost of re-ploughing, the cost of production had been actually increased by the cheaper methods of working. Sound judgment in such matters was quite as necessary as industry and hard work.

Another phase to be considered was the relation of the farming plant to the work required. For example, to work a 10-horse team either on an implement that required 12-horse strength or on an implement that could be worked with eight, was bound to make farming operations more costly. Attempting to work an area too large for the farm plant to handle actually increased cost of production, because where land was insufficiently worked or where the working was unduly prolonged, reduced production resulted. The last two points, although good in theory, and no doubt equally so in practice, were an ideal rather than a realisation with many farmers through force of circumstances. Keeping the correct balance between the numbers and kinds of livestock carried and the cropping area of the farm was another means of producing the most profitable returns for the least possible cost; and as the proportions necessarily varied according to the seasons and to the market values of the various types of livestock, it called for sound judgment and foresight. The production of a "sideline" out of what would otherwise be waste from a main line had the effect of reducing the cost of production on the main line. In the matter of labour, every man's time should be effective in the production of something of greater value than his labour cost, whether he were an employer or an employee. Farming an area without sufficient man-power to keep the working plant in full operation and at the same time to give proper attention to livestock could not be expected to produce the utmost return for a given cost. When labour was employed the cost of wages meant an increase in the cost of production unless the employee's work was effective in increasing the value of production to the extent of his wage and his "keep." If the extra value of production exceeded that amount then the hiring of labour might be said to reduce the cost of production by enabling more to be produced.

Points from discussions: Have only implements necessary for efficient working and avoid overhead expenses caused by idle implements. Get on to the fallow early and avoid extra workings, as they increased costs. In new country fire was very important in reducing working costs. A good initial burn saved much time and cost in clearing sticks, &c. A crop with good stubble should be burnt early in order to minimise bush cutting. (Secretary, T. Winters.)

LUCERNE: THE KING OF FODDERS.

The monthly meeting of the Yandiah Branch, held on 11th July, was attended by 12 members. Mr. A. O. Klem read the following paper:—

Lucerne is known as the king of fodders; it was cultivated in the early days and still holds its own as a perennial plant for pasture or irrigation purposes. Once it is sown, lucerne needs little attention and the plants will live for many years without having to be resown. If it is not given a chance to grow and if sheep are permitted to graze on it, the plants will soon die out. Fowls also, if allowed to scratch in it too much, will soon kill it.

Lucerne grows very well on local flats where it is flooded occasionally, but if irrigated it will grow much better. The best method of irrigation is to make small plots with banks around them, and flood these about once a fortnight. A very small plot may be watered with a sprinkler if the water is good, but if salty water is used on the leaves the sun will scorch them.

Before sowing lucerne, the land must be well prepared and free from weeds. It should be well worked and cultipacked. A shallow sowing with a drill or combine, followed by a light harrow, is the most satisfactory. Good results have been obtained by sowing 6lbs. per acre. The best times for sowing are early autumn or early spring, preferably August or September, as by that time one has a chance to have the soil in good order. Germination at that time of the year is also quicker, and frosts are not so severe.

The young crop should be cut with a grass-mower before allowing it to be eaten off by the stock. This gives it a better chance of growing stronger and the young plants seem much better for it. In a good season, or when the lucerne is a nice height, it may be cut with a binder and tied, thus making it better to handle. Lucerne may also be grown for seed, and this is very profitable. In harvesting the seed the stripper can be used, afterwards putting the seed through a small winnower. It has to be cleaned the same day that it is reaped. This year a small attachment was made to fit on top of the winnower to deal with the long stems, &c., which are always mixed with the pods after reaping and which do not come off the riddle. It worked on the same principle as a big E harvester, the long stuff coming out at the back of the machine and the pods at the front, the seed and dust going right through. The seed has to be cleaned a second time to remove the dust. The pods are best kept in a shed and turned twice a day until dry, then put lightly through a crusher to remove the remaining seeds. A harvester would not be a success, as it would choke with the green stuff that is amongst the seed at harvest time. (Secretary, O. Borgas.)

USE OF CEMENT CONCRETE ON THE FARM.

In the course of a paper dealing with the above subject and read at a meeting of the Brentwood Branch on 1st April, 1935, Mr. E. E. M. Twartz stated:—"A few of the uses of concrete on the farm are for foundations, floors, and walls of all buildings. It also finds its way into fittings in these buildings, and for the construction of water storage, water troughs, fencing posts, ornaments, rafters, flower pots, tennis courts and dozens of other uses. Cement concrete is a mixture of brick, stone, or gravel and sand bound together with cement. All the ingredients are thoroughly mixed together and then mixed with water. This mixture is placed into wooden moulds, where the moisture gradually dries off and a solid rock slab hardens out.

Concrete does not require any skill in using; just carefulness and thoughtfulness. The farm generally cannot run a concrete mixer, so it has to be mixed with a shovel. The mixing is one of the most important factors. The ingredients must be thoroughly mixed before the water is added. The material must be a uniform colour throughout. I have seen cement concrete work that has not been a success and the maker has put all the blame on the cement, but in 99 cases out of a 100 there has not been sufficient care taken with the mixing.

We are fortunate in having in our district such a fine deposit of gravel, which is ideal for floors and works up to about 4in. wide. Where a 4in. to 6in. thickness is required, use a good hard stone broken to a 2in. gauge. The mixture must always be measured; a guess is not good enough. Five parts stone or gravel, 3 parts sand and 1 part cement makes a good mixture for most concrete. Some may say it is an 8 to 1 mixture but that is not so. The stones are the strength of your work, the sand and cement being the filling. The above mixture should then be coated with a 2 to 1 or 3 to 1 mixture of sand and cement. Cement floors, which are the finest for most farm buildings, should, before the cement has started to set, have dry cement troweled into the surface. This leaves an excellent surface or finish.

Concrete fencing posts have not been used to a very great extent on the farms in this district owing to the fact that wooden posts can be procured from a neighbouring district, but the concrete fencing posts would be the cheapest proposition in the end. Cement concrete needs reinforcing with steel rods by allowing the concrete to harden around the rods.

With the present low price of cement and the many uses for it on a farm and the lasting and excellent job it makes, cement concrete will be used more than ever in the future. (Secretary, J. H. Boundy.)

SHEEP ON THE FARM.

The above was the subject of a paper by Mr. E. G. Jericho at the meeting of the Pinbong Branch on 25th May, when 12 members were present. Mr. Jericho advised selecting a line of large-framed Merino ewes. A large, square face was usually a sign of good constitution. Rams should be obtained from a reliable breeder. The sheep should be fairly fine-woolled, and the scales should be used to prove their value as wool producers. Ewes over 6 years old should be culled heavily. Wethers kept their condition best when 4 or 5 years old, and could then be sold during the winter months. To breed lambs for the freezers he used the Border Leicester ram on Merino ewes. Sheep lambing after the middle of May would generally rear a larger percentage of lambs, because there was usually some green feed available by then. Foxes would take some lambs if there were no young rabbits available. It was not profitable to keep a dog on a farm. If sheep had plenty of feed they were easily managed without a dog. Foxes and rabbits should be kept down. When poisoning rabbits with phosphorus it was best to throw the poison a long way into the burrow and then fill in the burrow. To cope with blowflies, everything should be kept clean around the homestead, all skins skin-washed, and stretched by means of a few nails driven into the woolshed. The blowfly trap should be made use of; an effective poison could be made by boiling a cabbage in ½ gallon of water, adding 2ozs. arsenic, 2lbs. of sugar, and pouring it over some meat in a large tin. Meat kept in a kerosene tin and scalded every 3 days made a good trap. Kerosene could be used to clean a sheep. Shearing should be done before grass seeds were about, the sheep being kept on good feed for the last three weeks. They should have access to all paddocks after the first winter rains, but should not be overfed for wool production.

Ten members were present at the meeting held on 15th June, when Mr. E. M. Scholz read the following paper entitled "Subdividing to the Best Advantage."—The subdivision of a farm is something which should receive much consideration and forethought. In most cases in the event of an uimproved virgin farm being taken up, no consideration is given to this important matter. A patch of land is cleared and fenced at random. The homestead and necessary outbuildings are in any position that may suggest itself at the moment, and so it is left to be a source of inconvenience. In my opinion the homestead locality is of great importance. Of course it is usual and right to choose a spot as sheltered as possible. In this district this natural shelter has been abused or not used to the full advantage. The timber has been cleared away right to the backyard, and the surrounding paddocks are bare and treeless. I think that at least 10 acres of timber should be left surrounding the homestead, thus providing shelter for the stock and the home. This block of timber should be fenced and all necessary sheds, horseyards, stables, cowyards, &c., be contained therein. The homestead block should be surrounded by small paddocks of about 20 or 25 acres and from these should be extended the subdivision fences. Crops should be sown in rotation form, working from one side to the other, *e.g.*, one block may be wheat with its corresponding small paddocks of oats, the next may be fallow, and the next grass or stubble land. The purpose of the small paddocks around the homestead would be to gain easy access to corresponding divisions. Panels from these small paddocks should be made to act a dual purpose if possible. This is possible where two fences cross at right angles, as they should do in this case Straining posts in each of the four fences are placed at equal distances from each other, thereby forming a square. Two panels are made so that they may be closed at either end and not fixed to any particular straining post. It will then be found possible to use these panels as a race to any of the three outlying paddocks or as a barrier from same. Fencing posts should be placed from 5 to 10 yards apart according to their strength. A very good fence may be made with four wire "cyclone" fixed about 3in. or 4in. from the ground. A barbed wire should then be fixed about 3in. or 4in. higher and on the opposite side of the fence. This is to prevent big stock from crushing and damaging the cyclone when reaching through the fence. On top of the posts should be fixed a second barbed wire making a strong, substantial, and stock-proof fence.

At a meeting of the Koppio Branch on 19th June, 14 members were present to hear a paper, "Sheep Returns per Acre" read by Mr. M. T. Gardner, who stated that in some parts of the district because of heavy rainfall and the hilly nature of the land, with consequent heavy working, continuous cropping did not give the most profit. The country was far from being cleared of scrub, and in many cases unprofitable farming had to be practised for a number of years in order to kill the scrub growth and pave the way for more profitable utilisation of the land by grazing. The large areas of uncleared land forming a portion of most holdings in the district were a burden on the better portion of the holding, because it cost the same purchase price per acre, and had to bear the same taxes, rates, fencing charges and general expenses, without materially contributing to the returns per acre of the holding. The scrub also sheltered rabbits which ate feed on the better land, and foxes which raided the sheepfolds at lambing time, thereby further decreasing returns. The writer quoted figures from his own property to show that by clearing and cropping the scrub areas, the return per acre from the whole holding could be increased. He pointed out that although the clearing, working, and sowing the crop with superphosphate involved a good deal of expenditure, the returns from the few years crops would to some extent compensate for it. With clearing completed, the battle to keep up sheep returns per acre would not be over. Additional fodder, both in the form of dry and sown feed was necessary. With 500 sheep, 20 tons of chaff fed in March, April, and May would build them up for the winter. If 100 acres of grassland were fallowed late with the combine (after grazing had been finished by concentrating a large number of sheep on the area in the spring), and sown dry early in the year with 4 tons of superphosphate and 1bush. early oats per acre, it would help the lambs to make good sheep or export lambs, and the extra wool and more valuable lambs would pay for the expenditure of supplementary feeding. Mr. Gardner preferred to use superphosphate in the above manner instead of applying it direct to grassland, but either manner gave profitable results. (Secretary, M. T. Gardner.)

HANDFEEDING SHEEP.

The following paper was read by Mr. L. A. Slade, of Weavers Branch, at a meeting held 3rd June, 1935:—"The question of feeding sheep by any other than natural means has been a topic for discussion for very many years amongst all classes of sheepmen. It interests the mixed farmer, because sometimes (due to the necessity of fallowing or burning his stubble) he must cut his feed temporarily to very fine limits, and to the station man, for the necessity of providing against very serious losses due to drought conditions.

To many farmers the feeding of sheep conjures up as many problems as trying to stable-feed horses in hard working conditions; to others an added lot of work for little return. But my contention is that it is none of these things, and if one is only going to look at his sheep feeding from this light, he may as well remain as he is at present, but he is not going to get anything like the return he might off his land from the sheep section of it. Handfeeding of sheep is not necessarily a constant job unless one wants especially to keep any for stud or other purposes. It is only a very good means of being able to tide your sheep over a period when you are short of feed instead of having to sell them, as often as not on an unfavourable market. This happens quite frequently to most men unless of course they are lucky enough to have big reserves of feed. If they have, it generally means that they are not producing all that they might from sheep activities. Feeding long hay I have found very impracticable, for the sheep soon learn to only eat the heads and the first stem, and so there is far too much waste. After trying troughs, open ground, bag troughs, and boxes, I have come to the conclusion that there is only one really economic way to do it, and that is in a properly constructed rainproof automatic feeder.

It can be made to hold at least a week's feed for 100 to 150 sheep, or several days for a larger number. Last year I had 450 on one feeder, although I do not recommend anything like that number; but 250 can be fed from one. The make of feeder I have costs about £21. It was amusing to hear farmers agree that they were a good proposition, but at £35 (which was then the price) they were too dear and if only they came down £10 they would be quite a good proposition. Now that they are down to about £20 the same farmers still hold that they should be down more in price. The men who talk this way don't want to spend a penny piece on their wool producing. I wonder how far they would get if they applied the same ideas to wheat and tried

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doing without super. The actual feeding need not be very much, for provided sheep have anything at all to pick at in the paddock (and water in dry weather of course), they do not eat very much, but what little feeding they do take seems to make a wonderful difference to their vitality.

Another aspect is that the practice of bare fallow will be to some extent modified in the future, and there is no better way to clean up a paddock than to place a feeder and a flock of sheep in it. With an occasional short change they seem to be able to finish it off like fallow, and for barley producing at any rate it is ideal.

In conclusion the writer is of opinion that the handfeeding of sheep may be summarised as follows:—The handfeeding alone of sheep would not be commercially sound as regards general flocks.

It does pay and pay well to have a feeder, and when one is temporarily short of feed to assist the flock with supplementary feeding.

It is an ideal method to bare right out a paddock, and instead of burning feed and so wasting it to get some return from that feed.

The worst nightmare a farmer can be faced with is to know he will soon be eaten out and will then have to sell numbers of his sheep regardless of what they will bring. Handfeeding will save this. But if you are never faced with this possibility, you certainly do not get anything like what you might out of this branch of your farming in average seasons.'' (Secretary, H. W. Cornish.)

Delegates at the Upper North Conference, Booleroo Centre, 17th July, 1935.

MANAGEMENT OF FARM HORSES.

At a meeting of the Warcowie Branch on 17th June with an attendance of 13 members and visitors Mr. E. C. Jarvis read a paper dealing with the above subject, in the course of which he said that when bringing in the team after spelling they should be fed gradually for a few days in order to become accustomed to the feed. They should be worked for a few hours at first, gradually increasing the hours each day to a full day's work by the end of the week. In hot weather it was advisable to put a chaff bag under the collar. It could be best done by buckling the collar and then moving it towards the head, hanging the bag over the neck and slipping the collar back into place. About 5 inches of the bag should be turned back and the hames placed over it in order to prevent the bag moving out of place. Another good practice to prevent sore shoulders was to wash the shoulders with salt and warm water immediately the harness was removed after the day's work. Where a sore occurred a pad should be placed under the collar, either below or above according to the space available, and the draft of the hames altered if necessary, as that was often the cause of a sore. A mixture of half and half kerosene and oil could be applied with a piece of cloth. If possible it was preferable to heal the sore while working the horse. Every farmer should breed 1 or 2 foals each year. If 2 foals were reared every other year they could be handled and worked while hay carting at 2 years of age, and would take the place of a horse during harvest, working half a day each. The best time to start a mare breeding was at 4 years old. A foal should be taught to lead when a few days old, and be tied up with a halter; also accustomed to having its legs picked up. That should be done every 3 or 4 months after weaning. A young foal should not be worked every time in the same place in the team, but should be accustomed to different places. It was a good plan to give them a few days on the rein occasionally, if they were at all suited for it. For feeding, long hay was suitable for the 2 evening feeds, with chaff and oats for the morning and mid-day feeds, according to the work required from the team. A team should leave their work before sunset, because if they were at all sweaty their coats would remain damp all night. The team should be watered before feeding, and be groomed every morning. The stable should be enclosed on 3 sides, with the open side facing the east. The fence should serve as a breakwind, and thus shelter the horses at night. (Secretary, A. F. Crossman.)

The monthly meeting of Boor's Plains Branch was held at Mr. A. Adams' homestead on 6th July. Mr. H. K. Queale read the following paper entitled, "Care and Correct Use of Harness and Working Equipment."—While I do not claim to be an authority on this subject yet I do claim that my methods are justified because of the results I have obtained during fifteen years I have been farming. To obtain the best results a man must have a natural aptitude for the work and a fondness for animals. He must also be patient and methodical. At the outset the primary necessity is a brush and comb. I prefer the "elbow grease" brand to the "glass case" brand. When not in use I advise a rail for collars, hooks for saddles and reins, and nails for winkers. The saddle should be hung by the strap immediately in front of the buckle attaching the breeching. A piece of half inch gas pipe fixed into a post is a good rest for the riding saddle. Of paramount importance in the care of harness is cleanliness. A thorough oiling at regular intervals is very beneficial. Collar linings should be well brushed regularly; the correct lining stands out deeper than the piping of a collar. The metal throat should be handled carefully and if possible not broken. The winkers need to be equipped with good rings, buckles and bits, while the blinds should stand out straight and firm and not point to the four corners of the globe. The reins especially need careful oversight, and should be well jointed and fitted with good spring hooks. The same may be said of the coupling straps. A riding saddle to be in good repair should be well and evenly padded; a broken "tree" renders a good saddle useless. For an apparent lapse of efficiency at work examine the harness before chastising the horse. Comfortably fitting and good equipment is a greater inducement to good work.

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BLOOD MANURE. BONE MANURE. BONE MEAL.

Now let us deal with the use of harness. The saddle horse, though a very useful and necessary animal, often receives very haphazard treatment. The saddle should bear evenly all over and the bridle should be fitted so that the bits do not drag on the horse's lips. A draught horse should be winkered so that he cannot see over the top of his winkers, while the bits should allow his mouth to remain in the natural position. The throat strap should be pulled up sufficiently tight to ensure safety and should be keepered. The forelock should be pulled out to hang freely. Collaring should be done with much care. The correct way to hold a collar is to grasp each side about half way up firmly in the hands without opening the top more than is absolutely necessary. This method will prevent the throat from being broken because of the support given it. I favour keepering the collar strap as an added help to holding the flap squarely across the top of the collar. To fit a collar one must have a certain amount of "horse-sense." A correct fitting collar should bear evenly and easily over its complete surface, while the fingers of the hand should be able to pass inside the throat, and the tips of the fingers to run round the rest of the piping. A loose collar creates friction and chafing, thereby rubbing off the skin's natural protector, the hair, and then naturally the skin rubs off, making a flesh wound. A tight collar pinches, the blood circulation is cut off, hence the skin dies leaving a sore similar to a blister. In young or very old horses there is a susceptibility to "blebs," requiring immediate lancing to prevent further complications. The hames should be fitted to the collar so that its length will just permit the hame strap to pass closely over the top of the collar. Its shape should coincide with the shape of the collar. Care should be taken to see that the link joining the hame at the bottom lies in the correct way, as this link is specially shaped, the bigger end resting in the hame. All mane hair should be pulled out so as to hang freely. Make sure that the draught hook is not too low on the point of the shoulder.

Now let us deal with the tandem team equipment, as that is the type of team mostly used in these districts. The swings should be sufficiently wide to allow the biggest horses to work in comfort, good hooks and bridle rings being essential. The chains should be light and strong, care being taken to see that no sharp ends of split links are protruding. The back bands should not be wrinkled and should be of such a length as to take the weight of the chains without altering the correct alignment. The leaders' spreaders should permit of a forty inch clearance, thereby saving the horses' ribs from chafing. The length of the coupling straps should allow the horses to stand up squarely in their chains, neither wider nor yet closer. For drill and binder work I prefer leather traces because of the narrow swings.

The Dray Horse.—The saddle should fit comfortably, without resting in any particlular spot. I advocate putting a bag under the saddle so as to preserve the lining, as well as acting as a little more padding. The breeching should be adjusted so that the D rests over the top of the rump directly between the hip points, and the breech part should come where the horse has most power and comfort—just below the point of the buttock. The tug chains should be of such length as to keep the horse from getting its collar over the point of the shafts and tearing his collar. The breeching chains should permit of comfortable walking while giving the maximum power in backing jobs. The back band should be taken up to a point where the dray balances.

Waggon Work.—The spiders should be adjusted according to the size of the horse carrying the chains at the natural trace position and with the "Rose" sitting in the same position as the D of a dray saddle. The belly bands may vary according to the temperament of a horse, but generally speaking should bear firmly against the girth when pulling, without any undue downward pull of the chains. The reins should pass through the leaders' hame rings, then at subsequent fixtures, passing through rings attached to lengths of straps (say 10in. or 12in. long) to allow for better manipulation by the driver. If any horses require shoeing, a competent farrier should be employed, which reminds one of the old English saying, "No foot, no horse." All harness should be carefully put away when not being used, if possible in a room set aside for the purpose. Above all remember that as the "eye of the master feedeth his stock," so should he also harness them. (Secretary, S. G. Chynoweth.)

LIVESTOCK AILMENTS.

Twenty-five members were present at a meeting of the Wasleys Branch on 13th June, when Mr. J. Rundle delivered an address dealing with the above subject. In the course of his remarks he said when a horse showed signs of sickness his pulse should be felt. That should be done by feeling along the jaw; the normal beats should be from 35 to 40 per minute. The majority of horse ailments were caused by disorders of the stomach, and were caused chiefly by eating damp or musty fodders. During times when fodder was scarce mouldy fodder could be fed safely by throwing it open to the sun and air for at least a day, thereby killing the injurious bacteria by exposure. In drenching a horse his throat should not be tickled or pinched; if the animal were given a light smack on the nose no trouble would be experienced. Small quantities should be given at a time, and the head should not be raised too high.

Damp and mouldy fodders set up gas pockets in the bowels, causing colic. An often recommended drench was 4 tablespoons of turpentine with 1½ pints of *warmed*, raw linseed oil. *For Sand*: 1 pint fresh milk with 1 dessertspoonful of tincture of nux vomica and ground coffee. A dose of the mixture should be given to horses after being brought off stubble fodder. *Blood-worms*: 2 pints of oats fed daily, pickled with strong bluestone solution by pickling 1 bag of oats with 1lb. bluestone to 2galls. water. Added to feed once daily for a week. *Spikes or Wounds in Hoof*: The spike should be withdrawn, and with the aid of a breast-drill, a hole should be bored to the depth of the wound. It should be then cleaned out, spirits of salt poured in, and plugged tightly with cotton wool dipped in Stockholm tar (repeated daily). *Chaff or Mote in Horse's Eye*: Place finger on upper eye-lid and push back over top of eye. Remove chaff by placing finger in mixture of equal parts of honey and powdered resin. Wash out with warm water and Epsom salts. *Founder*: Drench with 1 pint fresh milk, 4 tablespoonfuls bicarbonate of soda, 1 tablespoonful of ground ginger; followed 2 hours later by 6 packets of Epsom salts and 1 tablesponful salt, in order to cause thirst and thus make the animal drink. Stand the animal on wet clay. *Strangles*: House animal in roomy place free from draughts. Apply turpentine to abscess to draw it to a head. When the head forms lance it from top to bottom and syringe out occasionally with Lysol or other antiseptic. Steam with turpentine in hot water. Add saltpetre to drinking water. *Nose-bleeding of Racehorses*: Syringe adrenalin chloride solution into nostrils. *Extermination of Bot-Fly Eggs*: Apply tractor oil or other waste oil on any place where eggs are seen. *Trouble with Mare Foaling*: In cases of accidents such as ejection of womb, chloroform the mare and no further trouble would be experienced and the expulsion would immediately cease. Place chloroform bag to horse's nose at short intervals and watch the animal's side for breathing. After trouble of this nature douche out with water and permanganate of potash, or insert a gelatine capsule containing 2 drams of bismuth and 2 drams of iodoform. *Warts on Cow's Teats or Nose*: Apply castor oil daily for a week, and if not removed rub dry lemon or acetic acid on warts. *Discharge from Cow's Nostrils*: Blow burnt powdered alum into nostrils. *Prevention of Milk Fever*: Feed cow prior to calving with molasses added to feed. If affected with fever pump up; don't tie the teats but tap the hole with finger and it will seal. *Prevention of Bloat or Soursob Poisoning in Sheep*: Feed sheep prior to being put in field with chaff with either molasses, oats or bran added, and no trouble will be experienced. *Pink-Eye in Sheep*: Put affected animals in dark ventilated place, and to prevent infection rub equal parts of Stockholm tar and olive or castor oil over the eye—proved very effective. (Secretary, C. R. Currie.)

THE DAIRYING INDUSTRY.

The following paper was read by Mr. F. J. G. Collins at the Whitwarta Branch meeting on 15th July, 1935:—

The dairying industry is worth about £40,000,000 to Australia annually and will be worth considerably more in the near future. It all depends on the skill, keenness and enterprise displayed by dairymen.

There are several well-known breeds of dairy cattle in Australia, but there is no such thing as the "Best" breed, and I am positive that there never will be. Upon the ability of the man in charge depend the results of any breed, and it is important that the dairyman devote his time and energies to the breed he considers best fitted to his own particular conditions, and if he wishes to be successful, he must be sure that his heart is in the particular breed he fancies. Most of our successful dairymen now realise that testing is the only way to obviate feeding a lot of unprofitable cows. As a matter of fact the slogan, "Whether the cow keeps you or you keep the cow" is worth keeping in mind when dairying.

Always breed from the best producers, using a pure-bred bull. It is also necessary to give much attention to pasture improvement, involving the sowing of suitable grasses and clovers, together with the regular use of correct fertilisers and harrowing. The modern dairy cow has come to be regarded as a machine, but it requires much more consideration than most machines if the full return is to be obtained from it. It must be managed with sound judgment and a great deal of commonsense. Its health must be safeguarded; plenty of good water is vital.

In making a choice of dairy cattle attention will be focused on Shorthorns, Red Polls, Friesians, and Guernseys; the latter being somewhat large cattle requiring a richer or more level country with heavier feeding than the lighter breeds, such as the Ayrshire and Jersey. In hilly country and on the lighter grazing land the smallest breeds will prove much better to handle. In Victoria many dairymen even prefer the lighter cattle on rich country, such cattle being bred especially for dairying without consideration for dual purpose values.

The hard times being experienced at present in the industry are even harder for the dairyman who uses the "scrub" bull. That all the cattle breed societies have an increased membership since the drop in butter-fat prices is surely evidence that the scrub bull is a bad asset. It is beyond the power of dairymen to raise the price of butter-fat, but it is in every dairyman's power to get better returns from each and every cow. Remember that a good pure-bred cow which is a heavy producer is not as costly to maintain as the cow from the "scrub bull." At present there is a big proportion of second grade cream going to the factories, and consequently a much lower return to the dairymen as a whole. In a paper such as this it would not be out of place to suggest some remedy to improve the percentage of choicest grade of butter in this State. I would suggest a much more rigid control of the industry by the Department of Agriculture, such as by making a higher penalty on factories which grade first grade cream as "choicest" (there is a very severe penalty in Victoria), by making the factories submit to the Department a list of all the suppliers of second grade cream. The Department could then have officers inspect the farms of the suppliers of the second grade cream, find out the cause of the cream grading second, and then give the dairyman instructions for the attainment of "choicest" cream. Suppliers who then ignore the officer's instructions, after a reasonable time had been given them, should be fined, if the fault of the grading of cream was through their uncleanliness. You perhaps wonder where the money for such a proposal is to come from, to pay the cost of the officers' inspections, &c. I suggest that a levy be imposed of, say, 1d. for first grade and 2d. for second grade cream, and from such fund the supervision of the dairies be paid for. You will then note that the supplier of "choicest" grade does not have to bear the cost of such supervision. Well, why should he? It is not his fault that the other suppliers are sending inferior cream. If this proposal were adopted I am sure that in the course of two years the percentage of choicest cream in this State would be over 90 per cent., as compared with about 29 per cent. at present.

It would be hard to estimate the value of a greater improvement on the quality of our cream; it would create better uniform quality, thus giving us better prices. I do not want this paper to be construed so as to mean that I am reflecting on the good work that the Department of Agriculture is doing through its very able officers. (Secretary, F. J. G. Collins.)

POULTRY.

HENS *V*. INCUBATORS.

In the course of a paper read at the Nelshaby Branch on 16th May, Mr. K. Noble said that the hen was the natural method of hatching and rearing, and though not always reliable, she would supply natural heat, ventilation and care. On farms keeping 10 or more fowls a 60-100 egg incubator was necessary. The average hatch was 40 chicks from 60 eggs. The cost of fuel—1½galls.—was 2s. 6d. per hatch, the time taken in attending to the machine about 16 hours, the cost of the machine, allowing it a life of 20 years with 4 batches a year, was about 1s. 6d. per hatch. A brooder was also necessary and would cost about 1s. 6d. per hatch; although cheaper to buy it would not have the life of an incubator. The total cost of one hatch of 40 chicks from a 60-egg machine was approximately 15s., or about 17s. with a 120-egg machine. The cost of feed per hen was approximately 1d. per week. To raise 40 chicks, 4 hens sitting on 15 eggs each would be needed, costing 1s. for feed. Time taken in attending to the hens might well be 12 hours. Material used for nests and coops or house or yard taken over a number of years would reasonably be 1s. per hatch. A further cost of 1s. for feeding the hens during the brooding of the chicks made a reasonable total of 9s. 6d. per hatch and rearing of chickens to the same age as with an incubator. It would be seen that the hens were probably cheaper than an incubator by 5s. 6d. Eighty chickens from 8 hens would cost 15s., as against 30s. with a 60-egg incubator, and 17s. with a 120-egg incubator. The cost was therefore greatly in favour of hens as against a small incubator, but very little against a large one, because a big machine cost very little more in either fuel or time than a small machine. A great disadvantage of hatching from hens was that the usual broody period was rather too late for good hatching with regard to development of the chickens. Also, unless they were fed very correctly their laying began when the price of eggs was falling. For that reason alone chickens hatched early would pay for the necessary equipment. Chickens hatched in July—the general time of hatching by incubator—would develop and lay in December and continue through the period of high egg prices, except for a few which would moult if care was not taken. Chickens hatched in October—the usual month for hen hatching—would not begin laying except under very favourable conditions until June, a difference of 2 or 3 months in the cost of feeding, and with a falling price of eggs to follow.

The Advantage of High-Class Laying Hens.—A hen must be fed on food suitable firstly to maintain the body and secondly to produce eggs. If a flock of 100 hens capable of producing 300 eggs, totalling 2,500 dozen, was compared with a flock of hens producing 100 eggs it would be seen that it would be necessary to keep 300 hens of the poor laying, 100 egg strain, to produce the same total of 2,500 dozen, and at the same time it would be necessary to feed an extra 200 hens, which would also need further housing accommodation and attention. Further, the 300 hens of the 100-egg strain would produce the bulk of their eggs between July and December, during which time eggs were cheapest. The 100 hens of the 300-egg strain would necessarily have to produce their eggs over a longer period, whereby they would secure a much higher average price per dozen. The returns had been calculated (as shown below), the eggs of each strain being distributed over the general laying months of that strain, and priced by the prices received each month during May, 1934, to April, 1935:—

	£	s.	d.
100 hens of 300-egg strain produce 2,500 dozen eggs at approximate average price of 8d. per dozen	84	7	6
300 hens of 100-egg strain produce 2,500 dozen eggs at approximate average price of 7d. per dozen	74	7	6
100 hens of 100-egg strain produce 833 dozen eggs at approximate average price of 7d. per dozen	24	15	10

The figures showed £10 in favour of the 300-egg strain on 2,500doz. eggs alone, without extra housing, &c. It also showed £59 11s. 8d. in favour of 100 hens of 300 egg strain against 100 hens of 100-egg strain. The better layers would cost more to feed, but not £59 11s. 8d. above the cost of feeding the poorer layers. Feeding must be studied carefully. Tests conducted at Parafield Poultry Station showed that high laying hens could not be expected to produce the maximum number of eggs if fed as are those on the average farm. Neither could hens of lower laying strains be expected to produce many more eggs if fed the same as those of good laying strain, although they would improve in time by such feeding, if combined with correct breeding from the best stock. Fowls of high laying strain would degenerate in a very short time if not fed and bred correctly. Also fowls bred to a high standard would be liable to sickness if not kept to that standard, although if cared for correctly they would not be more subject to illness than the average fowl.

Selection of Eggs for Setting.—Since the trade demanded large eggs rather than large numbers of small eggs it was well to select eggs for incubation from those which were most likely to produce strong chickens of the best type, which in turn would produce large eggs. The eggs selected should be large, but not over-large, nor unshapely, nor those from pullets which were in their first year's laying, because there was a tendency to degenerate in the size of both hens and eggs produced from frequent hatching from such eggs. When selecting the eggs, they should be tested by lamplight to see that none were cracked. Stale eggs could also be detected; they showed a shadow within the shell which moved slowly when the egg was moved. It was caused by

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part of the contents thickening and settling to one side. Such eggs, as well as those very light in colour, should be rejected. Where it was necessary to keep eggs several days before the required number was collected, they would keep better if packed on end with the large end upwards. If necessary they could be kept a week before setting; if so, when hatching by incubator, the eggs should be heated slowly, reaching hatching temperature after 24 or 30 hours, because in older eggs the embryo which formed the chicken became weaker, and rapid heating would destroy it.

Incubators and a Few Points on Hatching.—Adequate ventilation on incubators was necessary, but draughts should be avoided as they might cause the eggs to be chilled on one side. Incubators of the hot air type were drier than hot water machines, needed a better moisture supply, and for the same reason needed less fuel. The correct temperature for hatching hen eggs was 101 degrees. In incubators the source of heat was generally above the eggs, so that one must allow for the temperature at the bottom level of the eggs being lower than at the top level. The bottom temperature was about 99 degrees, which required the top temperature to be about 104 degrees. If more eggs were placed in the tray than it was intended to hold they would be tightly packed together, which would tend to retard the penetration of heat. The temperature must be high enough to start the germ in the egg growing, or it would weaken and die. Therefore the first few days were the most important, and half a degree at that stage would make a lot of difference. Later they would withstand much greater variation in temperature, except when about to hatch. Eggs near the outside of the tray received less heat than eggs near the centre, and therefore should be changed about when the eggs were being turned. Eggs needed a good supply of air, not only in the machine, but particularly when they were taken out to be turned. The time of airing should be gradually increased to half an hour on the nineteenth day—unless the weather was very cold—after which the machine should be kept closed if possible. Turning the eggs too near to the time of hatching resulted in some chickens being placed with the beak downwards, and many would not hatch after chipping if in that position. Overheating the eggs continually or often would cause many "dead-in-shells." Lack of moisture would produce the same result. (Secretary, J. Lawrie.)

MANURE IN THE ORCHARD.

Fourteen members attended the meeting of the Warcowie Branch on 16th July, when Mr. F. Williams read the following paper:—

Fruit trees, like other plants, derive a portion of their food—about one-twentieth—from the soil. It follows, therefore, that a sufficiency of plant food must be present in the soil in order that the orchard may thrive.

It must be borne in mind that as far as plants of any description are concerned, "enough is as good as a feast." Any manure present in the ground, over and above the plant's requirements, is surplus, and for an orchardist to put it there is waste. At this point it may be as well to mention that some manures benefit the plant by improving the physical condition of the soil. By physical condition is meant the texture, the heaviness or lightness of a soil, or its water-holding capacity.

The error of supplying too much of any particular manure may be in the application of artificial manures, such as superphosphate or sulphate of ammonia. It is well known that many Australian soils are deficient in phosphoric acid. It is obvious therefore, that an over-application of nitrogen in the form of sulphate of ammonia is no remedy. Furthermore, it is difficult in many cases to ascertain just what manure or what particular plant food is lacking in any particular soil.

In the application of artificial manures lies another danger. It is well known that roots have two marked tendencies—(*a*) to be attracted by plant foods, and (*b*) to "chase" water (hydrotropism, hydro=water). It follows, therefore, that care must be taken where the manure is applied. If the manure is applied superficially, *i.e.*, on the surface, surface roots may result, to the detriment of the tree. Briefly, the further down a manure is placed, the better for the tree.

In view of the difficulties confronting the fruitgrower, many of them overcome the difficulty by using a general manure, that is to say, one which supplies all foods, such as stable manure or green manure.

Stable manure is good, but green manure which is ploughed into the soil is an improvement, as it needs no carting and spreading, and contains all plant building substances, whereas, in the case of horse or cow manure, much of these substances have already been removed by the animal. The application of such a manure serves a twofold purpose. It supplies all a plant's food requirements, as already stated, and, by the addition of humus, or decaying organic matter, it tightens up a soil which is too light, or renders more friable a clayey soil, which may be too stiff; and the capacity to absorb and retain moisture is improved.

The method of planting trees in an orchard requires some consideration. A planter must be guided by circumstances. A man who proposes to plant trees in a wet district would have to consider drainage, or his soil will become waterlogged and his plants perish. In digging the holes, care should be taken to see that these are no deeper than the surface soil—they must not penetrate the hard subsoil, or the hole may form a miniature reservoir, into which the water from the vicinity may drain, and drown the tree.

No such problem confronts the man living in a dry district. In fact, just what the dweller in a rainy locality finds it most necessary to guard against, is what is most desirable in less favoured parts. To allow trees in these parts the best chance of surviving and flourishing, the deeper the hole the better, especially if the cavity extends below the hard subsoil, if such exists. Under these conditions, the infrequent rains, if encouraged, drain into the hole, and soaking through the loose soil surrounding the roots, permeate downwards, taking with it probably much of the "goodness" of the soil in solution, and encouraging the roots to follow. If small waterings are avoided (they induce a surface rootage), a deep and well developed root system is established which results in more rapid growth, and probably a heavier crop. (Secretary, A. F. Crossman.)

THE AGRICULTURAL BUREAU.

At the annual meeting of the Mount Hope Branch held on 16th July, and attended by 12 members, Mr. D. K. Speed read a paper entitled "Stimulating Interest in Our Branch of the Agricultural Bureau." Poor attendances in the past had been largely due to lack of variety in the programmes of the monthly meetings. Papers had been the subject at every meeting, and members refrained from taking part in the discussion for fear of hurting the feelings of the writer. The lack of discussion of papers caused members to lose interest. In order to add variety to the programme he suggested holding a debate with 2 or 3 members a side and the balance of the meeting acting as judges. An annual crop inspection would give members a knowledge of how their neighbours worked their land. Usually only 9 meetings were held per year, and the above suggestions would help to add variety to the meetings. (Secretary, J. L. Vigar.)

In the course of a paper read at the annual meeting of the Morchard Branch on 14th June, Mr. C. Halliday, junior, said that the year of Bureau activities just ended had been one of interest to most of the older members. He asked had it been the same to the younger members, or had it been a bore to them to attend meetings? If the interest was there the younger members would attend; and if the interest was lacking it was the part of the older members to do something to supply that interest. The Branch could arrange more frequent visits and addresses by the local Departmental Instructors. Members should make every endeavour to induce visitors to attend meetings. If a non-member did not attend when invited the first time, he should be asked again. Mr. Halliday suggested that papers had had their day. They had been written and re-written and discussed until they had become a matter of routine at Bureau meetings. Something new was needed to awaken interest. Reports of past years all showed that improvements in farming practices were due to the Agricultural Bureau. If the Bureau was of such value to farmers in the past it would be of even greater value to the farmers of the future, as the need for improvement was just as great as ever it had been. (Secrtary, E. T. Tilbrook.)

QUESTION BOX.

The meeting of the Wasleys Branch held on 11th July took the form of a Question Box. Seventeen members were present. *Question*: Best type of harrow-bar to prevent dragging? *Reply*: A wooden or pipe bar fitted with 8in. wheels was best under damp conditions. A member suggested putting chains from the end of the bar to the swings to cause it to be lifted by the pull; or to place sticks through the adjustment loop

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passed under the bar protruding about 3in.—these would be most effective for leaves of 4 harrows. Backbands on the horses were also of assistance. *Question*: Cause of a ewe producing twin lambs—whether caused by the condition she was in when mated or by the ram she is mated with? *Reply*: Most English rams were prolific producers, but better results were obtained from ewes in good condition than in poor condition. *Question*: Would it be beneficial to roll barley or oat crops or leave them in a rough state? *Reply*: Under dry seasonal conditions it was beneficial to roll oat crops, especially oats which had to be cut for hay. (Secretary, C. R. Currie.)

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
South-Eastern District.				
Mount Gambier	14/6/35	15	"Milk Fever and Calcium Deficiency"—A. C. MacMillan	J. E. Morphett
Wolseley	8/4/35	9	Harvest Reports	E. W. Sharrad
Wolseley	18/5/35	140	Social	E. W. Sharrad
Wolseley	10/6/35	10	Discussion	E. W. Sharrad
Tantanoola	7/7/35	15	Annual Meeting	L. J. C. Osborne
Allandale East	11/7/35	14	Address—W. H. Downes	R. T. Laslett
Rendelsham	13/7/35	8	Annual Meeting	F. Todd, jun.
Penola	18/7/35	8	Annual Meeting	F. W. Hinze
Lower North District.				
Brownlow	12/6/35	15	"Farm Book-keeping"—G. H. Biar	A. R. Steinborner
Koonunga	10/7/35	20	Annual Meeting. Debate—Pigs *v.* Poultry	H. Mibus
Black Springs	9/7/35	10	Discussion	K. H. Dunn
Buchanan	10/7/35	12	Question Box	L. V. Bell
Rosedale	—/5/35	12	Address—C. A. Goddard	W. E. George
Rosedale	24/6/35	12	"Fruit Trees"—J. B. Ruediger	W. E. George
Hanson	9/7/35	22	Annual Meeting	M. deN. Lucas
Blyth	12/7/35	28	Travel Talk, Canada and U.S.A.—D. N. Martin	R. H. Eime
Penwortham	20/6/35	8	Address—M. W. Aird	A. R. Jenner
Tarlee	16/7/35	25	Annual Meeting. Address—H. J. Apps	N. L. Clarke
Greenock	15/7/35	18	Annual Meeting	A. Schubert
Stockport	12/7/35	15	Annual Meeting	R. Koch
Middle North District.				
Gladstone	9/7/35	14	Address—C. A. Goddard. Paper—Mr. Dunmore	Max Hoare
Gladstone	30/6/35	21	Annual Meeting. "Stock Ailments."—J. Rundle	Max Hoare
Beetaloo Valley	15/7/35	9	Annual Meeting	B. W. Giddings
Snowtown	12/7/35	14	Annual Meeting	A. R. Hocking
Wandearah	18/7/35	8	Address—H. B. Barlow	L. A. Jacobs
Redhill	16/7/35	9	Annual Meeting	Lance Harris
Upper North District.				
Appila	4/7/35	100	Annual Meeting (Social)	E. H. Wurst
Murraytown	18/5/35	11	"Care of Farm Machinery"—A. Scholz	E. B. Pitman
Murraytown	15/6/35	11	Discussion—"F.A.Q. Wheat"	E. B. Pitman
Black Rock	4/6/35	6	Annual Meeting	R. E. Kitto
Morchard	12/7/35	11	Exhibit of Useful Devices, etc.	E. Tilbrook
Baroota	8/7/35	12	"Horse and Cattle Breeding"—S. G. Stone	E. W. Hulster
Wilmington	16/7/35	25	Annual Meeting	P. C. Cole
Eurelia	24/7/35	13	Annual Meeting	E. P. Wall

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		YORKE PENINSULA DISTRICT.		
Weavers	1/7/35	15	Paper—L. M. Gleeson	H. W. Cornish
Brentwood	14/5/35	15	Addresses—R. Hill and F. Richards	J. H. Boundy
Brentwood	13/6/35	12	"Government Assistance to Farmers"—J. J. Honner	J. H. Boundy
Bute	20/6/35	6	Formal	H. G. Perry
Bute	18/7/35	7	Annual Meeting	H. G. Perry
Paskeville	16/7/35	10	Annual Meeting	J. Prouse
		WESTERN DISTRICT.		
Balumbah	3/7/35	14	Address—H. D. Adams	J. E. Swann
Maltee	4/7/35	14	Annual Meeting	E. Schwarz
Miltalie	25/6/35	10	Question Box	S. D. Ramsey
Green Patch	11/7/35	7	Discussion	C. J. Whillas
Taragoro	11/7/35	9	Annual Meeting	T. Winters
Balumba	17/7/35	13	"Control of Pests"—N. A. Jericho	J. E. Swann
Minnipa	16/7/35	—	Annual Meeting	W. H. Crowther
Pygery	16/7/35	12	Annual Meeting	A. Day
Kyancutta	4/6/35	15	"How to Improve our Grasses"—M. O'Brien and E. A. Kelly	E. A. Kelly
Kynacutta	2/7/35	12	Homestead Meeting at property of E. A. Kelly	E. A. Kelly
		EASTERN DISTRICT.		
Coomandook	2/7/35	16	Address—R. L. Griffiths	W. R. Trestrail
Yurgo	24/6/35	9	"My Methods of Cropping"—J. Bullen	H. M. MacKenzie
Lameroo	12/7/35	17	Annual Meeting. "Care Farm Machinery"—J. H. Spratt	A. G. Potter
Coonalpyn	10/7/35	11	Homestead Meeting. Pruning Demonstration—E. Leishman	C. C. George
Marama	19/7/35	8	Annual Meeting	Thos. C. Hinkley
Ramco	1/7/35	11	Address—E. Leishman	J. J. Odgers
Ramco	15/7/35	10	Annual Meeting	J. J. Odgers
Coomandook	26/7/35	12	Annual Meeting. Question Box	W. R. Trestrail
Chapman Bore	22/7/35	12	"Care and Handling of Wool"—W. Whitehead	J. P. Krollig
		SOUTH AND HILLS DISTRICT.		
Blackwood	9/7/35	—	Annual Meeting	H. Goldsack
Longwood	15/6/35	10	Homestead Meeting—Mr. A. Cameron	H. G. Haines
Hartley	10/7/35	7	Annual Meeting	W. J. Brook
Frayville	11/7/35	10	"Marketing"—H. Schofield	H. H. Ramm
Echunga	10/7/35	12	Annual Meeting	L. H. Walters
Shoal Bay	16/7/35	4	Annual Meeting	E. B. Bell
Cherry Gardens	13/7/35	9	"Fattening Pigs"—D. B. Blakeley	A. R. Stone
Port Elliot	20/7/35	—	Annual Meeting	F. C. Keen
Blackheath	18/7/35	7	Annual Meeting	E. H. Paech
McLaren Flat	11/7/35	24	Address—A. Ophel	P. T. Wait
Inman Valley	25/7/35	10	Annual Meeting	S. Hacklin

WOMEN'S BRANCHES.

SUBJECTS FOR BUREAU MEETINGS.

If you have no other subject in mind, here is a list from which you might choose when asked to contribute to your branch programme.

The Farm.

- Dairying—
  - Care of Milk and Cream
  - Buttermaking
  - Cheesemaking
- Pigs—
  - Bacon Curing
- Beekeeping—
  - Honey
- Horticulture—
  - Vegetable Growing
  - Flower Growing
- Poultry—
  - Dressing
  - Incubation
  - Rearing Chicks
  - Turkeys
  - Ducks

The Home.

- Home Management—
  - Furniture—
    - Choice
    - Repairing
  - Needlework
  - Knitting
  - Rugmaking
- Clothing—
  - Choice
  - Repairing
- Dressmaking
- Pattern Afternoon
- Children—
  - Care and Management
- Cooking—
  - Recipes
  - Recipes for Christmas
- Lunches
- Jam Making
- Fruit Preserving
- Fruit Drying
- Fruit, Value of
- Pickles and Sauces
- Sweet Making
- Exhibition of Home Crafts
- Christmas Gifts
- Home Nursing

General.

- Inter-Branch Visits
- Competitive Exhibition
- Flower Show
- Practical Demonstrations
- Social
- Music in the Home
- Good Reading
- Hobbies
- Physical Culture
- Labor Saving Hints
- Spring Cleaning
- Entertainment in the Home.

THE USE OF CUCUMBERS.

The following recipes were given by Mrs. W. Patterson at the meeting of the Williamstown Branch held on 11th April:—

Pickled Cucumbers or Gherkins.—Obtain cucumbers or gherkins carefully picked and as near the same size as possible. Make a brine strong enough to float an egg, and for every 2 quarts of white vinegar, add ¼oz. cloves, 1oz. of white ginger (bruised), ½oz. mustard seed, ¼oz. of mace. Boil the brine and pour over cucumbers in an earthenware jar. Leave overnight. Next day drain off quite dry. Put all spices and vinegar in a stewpan and bring to boil for a few minutes. Pack cucumbers into a jar, strain the vinegar over them and let stand 24 hours, then put all back into the stewpan. Let simmer until cucumbers are green, but do not boil. Put in jars or bottles and seal at once. If sweet pickle is preferred add a breakfast cup of sugar.

Mustard Cucumber and Apple Pickle.—2lbs. cucumbers, 1lb. each apples, onions and sugar, ½oz. tumeric, 1 teaspoon mustard, 1 tablespoon plain flour, a few chillies, allspice and cloves to taste. Peel and cut cucumbers, apples and onions. Add good handful of salt and stand all night. In the morning drain off the liquid and put into preserving pan. Cover with vinegar and add sugar, also cloves and allspice in a little bag. Boil 18 or 20 minutes. When boiling, add mustard and tumeric mixed with vinegar, and bring to a boil again. It is ready for use when cold.

Cucumber and Apple Chutney.—4lbs. each cucumber, apples and onions, 2lbs. sugar, 1oz. cloves, 2 handsful raisins and/or sultanas, 1oz. peppercorns, ½oz. cayenne pepper. Cut up cucumbers, apples, onions and sprinkle with salt and stand overnight. Strain and add ingredients and cover with vinegar. Boil for 1 hour.

Pickled Cucumbers.—20 cucumbers, apple or long, freshly picked. Lay in a strong brine for 24 hours, then take out and drain. Boil enough vinegar to cover them, to which ½ tablespoon allspice, a few chillies and bay leaves, and a small cup of sugar have been added. Drop cucumbers into boiling vinegar and stand 3 minutes. Cool in vinegar and then put in jars and seal down. (Secretary, Mrs. A. Cundy.)

CONFERENCE OF UPPER NORTH WOMEN'S BRANCHES.

The members of the Wepowie Women's Branch have every reason to be proud of the success which attended their first effort at organising a district conference. Mrs. J. Burns (Wepowie) presided over the meeting, there being a record attendance of women at all the sessions—delegates being present from Eurelia, Wirrabara, Belalie, Wilmington, Morchard, and Wepowie Branches. In addition the women of the local Branch arranged the catering for approximately 300 people, and assisted in the staging of an excellent exhibit of preserved fruits, small goods, jams, needlework, &c.

The following resolutions were carried:—

1. That the Baby Health Train be sent out on the narrow gauge systems to outback towns where it is a necessity, as doctors are not so plentiful as with the districts on the broad gauge lines.
2. That the Women's Bureau Section of the *Journal of Agriculture* be enlarged and improved.
3. That this conference is in accord with the suggestion of the Narridy Women's Branch that a non-competitive exhibition of women's handicrafts should be staged at the Annual Congress.

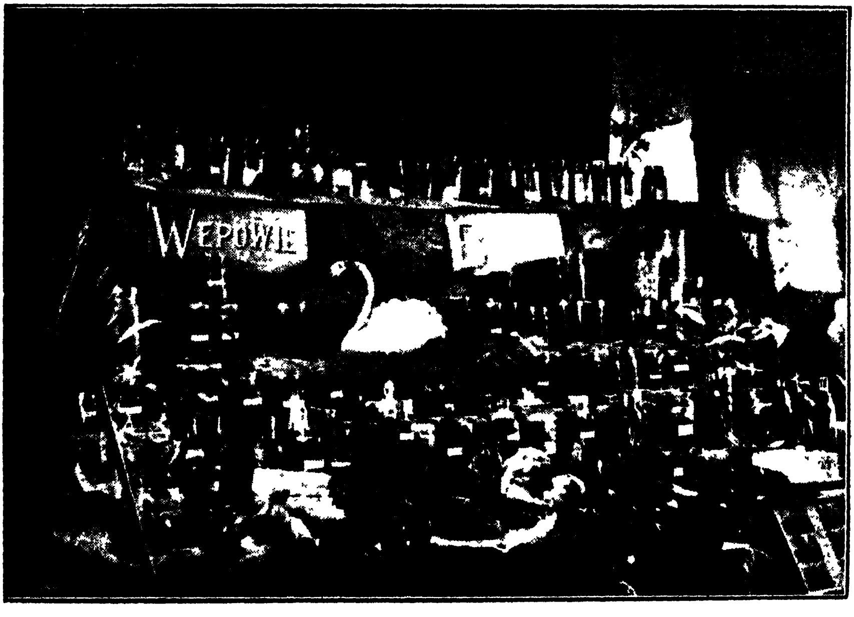

Exhibit staged by the Wepowie Branches of the Agricultural Bureau at the Upper North Conference, Booleroo Centre, 17th July, 1935.

Miss E. Campbell, Dip. Dom. Econ. (Education Department), addressed the Conference, and Mr. J. O. Hatter (District Dairy Instructor) spoke on the care of milk and cream on the farm.

The following papers were read and discussed:—

RENOVATING AND REPAIRING CLOTHING.

[Mrs. Fred Cummings (Belalie).]

Many a garment which in more prosperous days was cast aside, is now renovated and refashioned. Last season's frock is quite fresh with a new vest or collar and perhaps a little alteration to the sleeves, which always date a garment.

A costume makes a nice coat frock for the house when past out-door wear, and a tweed coat may be fashioned into a wrap-round skirt. On large figures frocks always wear under the arms first, and it is annoying to find a frock of good material spoilt in this manner. Such a frock can be renovated by cutting out the worn parts, then making a yoke or pinafore effect with contrasting material. The sleeves may be all contrast, or top of one kind and lower part of the other. A glance through the fashion books will give plenty of ideas. Adult garments can always be made over for children. Small pinnies or bloomers may be made from men's fashion shirts, while Fuji silk shirts make blouses or bloomers. It is just the collars and sleeves of shirts which wear out, leaving quite a lot of good material to be used up. The best pieces of a worn-out flannel will often make a flannel for a small boy, and a pair of knickers with lots of wear in them may be cut from a pair of worn-out tweed trousers. Made with double seats they last longer.

It is often a problem to know what to do with the clothes of the growing girl; they so soon become too short or too tight. If the sleeves and bust of a frock are too tight, cut the frock off at the waist and make a skirt to wear with jumper or blouse. If not too short, it could be made into a pinafore frock by cutting out the sleeves and the neck, then binding the edges with military braid, bias binding, or pieces of the same material cut on the bias. If a pinafore frock is too short, it may be lengthened by joining short pieces with pointed ends on each shoulder. Finish with buttons on the points back and front. Another way to lengthen a frock is to open out the belt and stitch it into the waist of the frock, a wider belt of the contrast material will hide the join, and a couple of inches are added to the length. If the hem of a child's frock is bound with bias binding before being hemmed, to lengthen, undo the hem, press, and the job is finished.

When renovating, do not forget the useful packet of dye. If the directions with each packet are followed carefully, home dyeing is simple, and a faded garment has a new appearance after a dip in the dye bath. If it is not necessary to do these things for children in the home in spare time, use up old garments to clothe some poor unfortunate child who is in need of warm clothing.

REPAIRING CLOTHING.

"A stitch in time saves nine," is well worth remembering when taking care of clothing. A small hole or tear neglected soon becomes a big one, and requires more than the proverbial nine stitches to repair it. Repairing is an important part of woman's work, more especially where there is a family to clothe.

Men's and boys' garments are usually the most difficult to keep in repair, so these hints may be useful. Frayed edges of coat fronts, sleeves, and the edges of vests look very untidy, and these may be bound with braid or some matching material cut on the bias. Another way is to pare the rough edges and buttonhole with strong thread. The following is a quick way to patch the knees of men's trousers:—Rip up the side seams and cut out the worn part. Cut a piece of material (the same or a near match) a little bigger than the worn piece. Stitch the new piece to the top and bottom edges, then stitch the side seams again and the job is finished. Sometimes a hole is torn in a perfectly good suit, and the best way to repair this is to darn it neatly with threads drawn from the same material. If none of the material is available, pull some threads from the inside seams of the trousers. A tear mended in this way is not noticeable. With school boys, mother's trouble is to keep sound seats in their knickers. The best way is to reseat instead of patching. Again it is wise to use a piece of the same material or a match as near as possible. Unpick the lining from the waist, then unpick the side and back seams and cut out the worn parts. Cut new pieces a little bigger than the old to allow for turnings. Join to the top and bottom where the old pieces were cut off. Press the seams well, then stitch the sides and back seams and press again. Attach the lining to the waist and the knickers will be as good as new, with no unsightly "bull's eye" patches to annoy the small wearer. Men's trousers may be mended in the same manner. See that trouser buttons are sewn on tightly, use very strong cotton or thread (crochet cotton in a coarse number is good). Put a pin through the material at the back and sew over this. When the pin is removed it leaves the threads loose, and if the cotton is twisted round and round under the button it forms a strong hold. When the tail of a flannel shirt wears out, put a fresh one on with new flannel, not old. Patches on flannel should be herring-boned on the raw edges; a flannel patch is too thick and bulky if turned in and hemmed. Patch underpants with a piece from an old pair. This is better than darning, but be sure the material is put on the same way or it will not stretch or give. If the cuffs on a shirt wear and the rest of the garment is sound, unpick the cuff and take it off. Turn the part that was inside towards the outside and stitch it on again. The worn part of the cuff, which naturally comes on the inside after it has been turned, should be neatly darned with cotton or silk. Often the sleeve of a coloured fashion shirt wears into a hole and no matching material is at hand for a patch. Cut off the tail for patches and put on a new tail of some plain material. When putting new neck-bands on shirts, cut pieces for the fronts and put on with the neck band. It saves the wear on the front. It is easier to patch the children's bloomers if the seams are unpicked and the patches joined in with the seams. To save time, stitch the patches on with the sewing machine. Stitch close to the edge and it is quite neat and very strong. Then cut out the worn parts and hem by hand. When putting a patch on a frock or apron with a pattern on the material, put the patch on the right side, and take care to match the pattern exactly. Holes or tears in woollen frocks are neater if darned with threads drawn from the same material. Stocking mending is a problem to mothers of families. Darn the holes on the cross and they wear better. Use a mushroom darner for large holes. It is a great help, and double wool will fill the hole quicker. Too many darns are not comfortable so it is better to put new feet in the socks or stockings. Cut out the worn feet and replace with fresh ones cut from the legs of an old pair. If too short, unpick the hem at the top, or add a piece to the top. Home knitted socks or stockings may have new feet knitted

THE
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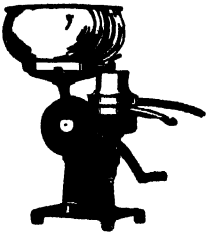

BUT IS
WORTH
MORE

THERE'S A REASON!

A. W. SANDFORD & Co.,
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to the legs by cutting off the feet and picking up the stitches. This is less work and gives the socks a new lease of life. With silk or lisle stockings, one must stop a ladder at once or it will run the whole length of the stocking and spell ruination. If the silk stockings are good ones, it pays to get them repaired. One can buy a special needle for repairing silk stockings, but it is a great strain on the eyesight, and scarcely worth the risk, when one can get them mended by an expert at a reasonable charge.

This hint is worth trying; when buying stockings procure two pairs the same, then if one stocking gets a ladder, it will still be possible to use the odd one by making up a pair from the others.

APPLES AND THEIR USES IN THE HOME.

[Mrs. P. Cole (Wilmington).]

As good apples possess valuable properties, their medicinal value cannot be overestimated, and as a general rule, they are so cheap as to be within the reach of all households. Fruit is especially necessary to children, and they tire very quickly of baked and stewed apples, but if they are presented in new and attractive forms, they will be readily consumed and appreciated. The white of an egg whipped to a stiff froth, sweetened and placed on stewed apples or spread over the baked ones, and served as a frosting will appeal to the children at all times, and if the apples are supplied with stuffings of raisins, dates, or apricot jam, these all make for variety and will ensure a speedy disappearance. Variety in cooked apple dishes is a consummation not always attained by the home cook, and these somewhat different sweets will surely meet with a warm welcome.

Recipes.

Apple Custard Pudding.—Pare, core and quarter 1lb. of apples, and cook in 2 tablespoons of water until soft. Remove from the stove, add a pinch of salt, a small cup of sugar, a generous tablespoon of butter and the grated rind and juice of 1 lemon. Mix 1 cup fine bread crumbs with 1 level tablespoon cornflour. Add 1 cup milk and the well beaten yolks of 2 eggs. Beat well with the apple mixture, leave for 20 minutes, then pour into a well greased piedish, and bake about 45 minutes in a very moderate oven until a delicate biscuit colour. Whisk the 2 egg whites very stiffly with 2 level saltspoons of cream of tartar. Pile in rough heaps on pudding, and return to oven to set. Serve hot or cold with cream or custard.

Apple and Cornmeal Mould.—Pare, core, and slice very thinly 1lb. cooking apples. Squeeze the juice of a lemon over and add the grated lemon rind. Pour 2 cups milk over 1 cup cornmeal, add 1 saltspoon salt, 2 tablespoons finely chopped suet, 1 cup brown sugar, 2 tablespoons fine breadcrumbs and 2 well beaten eggs. Stir in sliced apples, add 1 level teaspoon of carb. soda dissolved in 1 tablespoon boiling water, mix all well together and pour into a generously buttered basin. Cover and steam 3 hours. Serve with custard or sweet white sauce.

Apple Conserve—Make a syrup by boiling 2 cups loaf sugar and 1 cup water for 10 minutes; pare and core 6 apples. Cut each into 8 pieces and drop into boiling syrup. Peel a navel orange, remove pith, chop coarsely, add to the boiling apples and cook carefully 25 to 30 minutes, then pour into small glass jars and store as any other preserve.

Apple Loaf.—Those who make their own bread will find this a delicious recipe. When making a batch of bread, leave enough dough to make a small loaf, and work into it 1 tablespoon butter, 2 tablespoons castor sugar, a pinch of powdered cloves, and 2 well beaten eggs, add sufficient flour to make a light dough, and set to rise in a warm place until twice the size. Divide into 3 equal pieces and flatten each piece out to fit an oblong bread baking tin. Well butter the loaf tin, put the first layer of dough in and cover with a good layer of finely chopped cooking apples; cover with the second layer of dough, then more apples, and lastly a third layer of dough. Put in a warm place to rise to the top of the tin. Brush lightly with egg white, shake castor sugar over and bake in a good oven for 1 hour until brown. Serve hot with brown sugar and cream or treacle sauce; or cold cut into slices well buttered; or with honey served separately. Excellent fare for a picnic hamper.

Baked Apple Dumplings.—Peel 6 medium-sized apples very thinly and core them. Do not cut them up. Put sugar and cloves in each apple and roll pastry around each one. Place on greased tin and bake slowly for ½ hour.

Apple Pancakes.—2 eggs, 2 cups milk, 1 cup minced apples, 1 tablespoon sugar, 1 cup flour, 1 teaspoon baking powder. Beat eggs well, add milk, and gradually add flour to a smooth batter. Beat well and add sugar, apple and baking powder. Fry in a hot buttered frying pan; dust with sugar and serve.

Baked Apple Pudding.—Well butter a pudding basin and sprinkle freely with brown sugar. Prepare a short crust and line the basin with this. Fill the basin with apples, sprinkle with sugar and lemon juice and place a layer of pastry on top. Bake in hot oven and serve with sweet sauce.

Apple Snowballs.—The remains of a cold rice pudding, 4 or 5 apples, castor sugar. Peel and core apples and coat them with the mixture, which must be thick to mould round the fruit. Tie these in cloths or carefully place them in a steamer and cook for about ½ hour until the apples are cooked through. Place on a hot dish, sprinkle very freely with castor sugar, and serve with a little melted red currant jelly poured around.

Apple and Fig Roly Poly.—2 or 3 apples, 2ozs. figs, 2ozs. sugar, pinch of nutmeg, ½lb. suet pastry, peel and core apples and cut the figs in strips (after being soaked if dry figs are used). Prepare the suet crust, roll this out and place apples and figs on it. Roll up and tie in a scalded cloth. Boil 2 hours. Serve with white sauce.

Sweet crust for Top of Apple Pudding.—6ozs. fine bread crumbs and 4ozs. sugar. Arrange very closely in a piedish the apples, peeled and cored, with sugar. Spread the mixture of breadcrumbs and sugar upon the apples, smooth it down firmly, sift some sugar over the surface and bake in a quick oven about ¾ hour.

Apple and Rice Meringue.—1 cup rice, 1 gill milk, 1 dessertspoon sugar, 1 egg, 1 teaspoon butter, apples. To the well boiled rice add the thick yolk of egg, butter and sugar. Stir over fire until quite hot, but not boiling. Add the well beaten white, keeping a little back to decorate with. Put some stewed apples at the bottom of the dish. Put some rice mixture on top and decorate with unused white of egg. Set in oven until a pale brown.

Bird Nest Pudding.—6 large apples, 1 teaspoon cinnamon, 1 tablespoon butter, 3 eggs, 2 teaspoons flour, 1 pint milk. Peel and core apples. Cut in half and make hole in centre. Fill with paste made of cinnamon and butter. Put in dish. Pour over batter made of eggs, flour, and milk. Bake 1 hour.

Apple Tapioca.—1 teacup fine tapioca, 1lb. apples of uniform size and a few cloves. Wash the tapioca well, drain and soak overnight in 1 pint of lukewarm and slightly sweetened water. Core the apples without peeling or cutting, stick a clove into each apple and place them in a piedish. Pour the soaked tapioca over the apples and bake until tender. Serve hot or cold, with milk and sugar, cream or custard.

Fried Apples for Pork Curries, or Sausages.—6 apples, frying fat. Peel and core the apples and cut across in thick rings. Fry in hot fat for 5 minutes. Drain and serve in a hot dish.

Apple Jelly.—6 large apples, ½lb. sugar, ½ pint water, 1 lemon, a few drops cochineal, 1oz. leaf gelatine; peel, core and stew apples in the water, add grated lemon rind and juice. Add sugar and rub the pulp if lumpy through a sieve. Dissolve the gelatine in a little warm water and stir into the apple mixture. Add also the cochineal. Place in a wetted mould and allow to set. Turn out and serve with cream.

Apple Cheese Cakes.—1lb. apples, ¼lb. sugar, 1oz. butter, 2 eggs, a little grated lemon rind, ½lb. good pastry, prepare the pastry and line some patty pans with this. Prepare the apple mixture peeling, coring and stewing the apples. Add the sugar, butter, eggs and lemon rind, and stir well. Place a little of the mixture in each pastry case and cover with narrow strips of pastry. Brush with white of egg and bake for 20 minutes until nicely browned.

Apple Nut Cake.—2 cups flour, 1 cup sugar, ½ cup butter, 1½ cups warm stewed apples (unsweetened and dry), 3 dessertspoons cocoa, 2 level teaspoons bicarb. soda, ½ teaspoon each of grated nutmeg, cinnamon and mixed spice, ½ cup each of raisins and chopped walnuts. Cream butter and sugar, dissolve 1½ teaspoons soda in hot apple pulp and add other ingredients, and lastly mix in flour with level teaspoon cream tartar and other ½ teaspoon soda. Put into a well greased shallow tin and bake ¾ hour in moderate oven.

Apple Tart.—2 tablespoons butter, 2 tablespoons sugar, 2 tablespoons water, 1 egg, 2 cups S.R. flour, pinch salt, halve the mixture, roll out and spread stewed apples on paste and roll the other half of paste and put on top. This is an excellent tart and can be served at afternoon tea cut in diamond shapes with whipped cream on top and good for lunches as it keeps so moist.

Apple Sandwich.—Grate a ripe apple finely, blanch and halve some almonds, mix with the apple and arrange between slices of buttered bread, add a little whipped cream if desired.

Cream and Apple Sandwich.—2 cooking apples, 1 tablespoon chopped walnuts, 3 tablespoons cream, white bread and butter. Peel, core and cut apples into thin slices. Place on buttered bread. Cover with cream, sprinkle with walnuts and pair.

Pickled Apples.—Something rather different from the usual run of pickles and more pleasing to the palate can be made with cooking apples. About 1½ dozen small apples; allow 1½ quarts vinegar, 3lbs. sugar, 1oz. whole spice, 1oz. whole ginger (bruised and broken), 1 teaspoon cloves, 1 or 2 blades mace, boil the vinegar with the sugar and spices (tied in muslin bag), put in the apples and cook gently, not letting them break when they are cooked. Lift them out and place them in a large jar, pour the spiced vinegar over them and set the bag of spice on top, tie down when cold.

Apple and Tomato Chutney.—6lbs. tomatoes, 1lb. sugar, 4 large apples, 1 pint vinegar, 1 tablespoon salt, ½oz. cayenne pepper, 2ozs. garlic, ¼oz. cloves, 1½ozs. white ginger, boil 3 hours until thick.

Apple and Fig Jam.—Allow 3lbs. of preserving sugar to 1lb. of figs, 3 pints of apple juice, and 1 pint water. Boil figs slowly in water, for 1½ hours, add the apple juice and sugar, and stir the mixture well until every particle of sugar has dissolved. Continue to boil it until a little jellies when tested on a plate.

Apple Cider.—Take 8lbs. apples, 1½galls. water, 1 heaped cup soft sugar, ½ teaspoon compressed yeast. Cut apples into small pieces and add water, bring to the boil, and immediately place in a cool room to cool. When lukewarm mix the yeast with 1 cup of the warm liquid and add to the mixture, leave for two days, then strain through muslin, add sugar and stir well; when dissolved, bottle and tie down corks. Yeast may be omitted, in which case add raisins to each bottle to hasten the action. Will be ready for use in two days.

An *apple* eaten before retiring at night is excellent for removing all food from the teeth.

There are those who feel so enervated during the extreme heat that the idea of food is revolting, but a few pieces of fresh fruit will usually tempt them. An apple is an excellent substitute for meat, and much better than a meal taken under protest.

BREAD MAKING ON THE FARM.

[Mrs. M. Christophersen, Wilmington.]

The principal factor in making good bread is good yeast and good flour. Most of the recipes are too complicated, and take too much time and labour for the busy housewife. The following method is most simple, and gives good results.

Yeast.—When cooking potatoes for dinner, take out 1 medium-sized potato, and mash it, and add 1 cupful of water that the potatoes were boiled in. Leave until cool. Pour 1½ cups of boiling water on one heaped tablespoon of hops and boil 4 or 5 minutes. Put 1 tablespoon each of flour and sugar in a basin and mix, then strain the boiling hop water on to it, stirring while pouring it on. Allow to cool, then mix potato and hop mixture together, put in yeast bottle, and tie cork down. The yeast should be ready for use in about 6 hours.

Bread.—6lbs. flour, 2 tablespoons salt, 3 pints warm water (or half-separated milk), 2 cups of yeast. Sift flour and salt into dry, clean bread pan. Make a well in centre of flour and gradually stir in liquid and yeast. Mix into nice dough and then knead for 20 minutes. It should then feel smooth and springy to the touch. Cover up warmly in winter and leave to rise overnight (in summer time mix the dough in the morning, on account of it rising so much more quickly).

In the morning knead it down, taking care not to mix more flour into it—just enough to keep the hands from sticking. Divide into four, and form into loaves. Put into warm greased bread-tins (lightly floured). Place tins on oven door, cover with cloth, and leave to rise for an hour, or until it has doubled its bulk and the tin feels light. About 15 minutes before the bread is ready for the oven, close oven door and heat; then bake for 1 hour. When cooked, the bread should give a hollow sound when tapped on the bottom. The above quantity of yeast is sufficient for the bread recipe and for the following yeast cake recipe.

RECIPES.

Yeast Cake.—1lb. flour, pinch salt, 3ozs. or 4ozs. butter or dripping, 5ozs. sugar, 3ozs. or 4ozs. sultanas, 1 cup milk, essence of lemon, ½ cup yeast, 1 or 2 eggs. Add little more milk if only 1 egg is used. Sift flour and salt, rub in shortening, add sugar, fruit, make milk hot and add to beaten egg. Add yeast, pour into dry ingredients and mix thoroughly. Cover same as bread and leave to rise overnight. In the morning put into greased flat dish and leave to rise 1½ hours before baking. When ready to bake, brush top over with thin cream and sprinkle the following mixture on top:—½ cup sifted flour, ½ cup sugar, 1 teaspoon of cinnamon; rub in 2ozs. or 3ozs. of butter—enough to make it crumbly. Bake 40 minutes.

GIVING THE CHILDREN A BIRTHDAY PARTY.

[MRS. J. BURNS, Wepowie.]

A birthday party! What colour and gaiety the word conjures up in childish minds. The balloons, paper caps, and gaily set table need cost very little in money; just a little time and trouble and the food need not be rich to achieve success. It is the way it is served and the little finishing touches that are in keeping with the party atmosphere. The first thing is the birthday cake. Turn the cake into a merry-go-round. Swirl the icing, pink for choice, round the top of the cake, which for small children should be a plain sponge. In the centre the pole is a striped candy stick, and from it run pink ribbons, which are stuck down to the edge with gum drops. At the end of each ribbon —as though marching round—place a tiny toy animal, which later can be souvenired. A large circle of cardboard underneath the cake is covered with white paper, and here the candles are fixed. A variation of the foregoing is a gay maypole with little dolls instead of animals.

When choosing the "menu" for the party, here are a few novel ideas that will appeal to them. For the sandwiches, butter bread and make a sandwich of banana sprinkled with sugar and a little lemon juice, butter on top, and sprinkle with "hundreds and thousands."

Little cakes are always a favourite. Recipe: Cream about 1 cup sugar with ½ cup butter, add 2 beaten eggs, ½ cup milk, 2 cups S.R. flour; cook some of the mixture in crinkly cake cups. Ice with white icing, then decorate the cakes to represent faces. This will require a little cochineal for the mouth and cheeks, brown for eyes and eyebrows, a little saffron or brown for the hair. Make a number of different types of faces. Bake some of the mixture in boat-shaped patties, ice in many colours, and fit them with toothpick masts and gay little paper sails, on which print the names of the wee guests.

Orange Baskets.—Select nice ripe oranges, cut a small ring of skin off the bottom to make them stand firmly; then cut to form a basket. Remove the pulp of the orange, being careful not to break the handles; then fill with jelly or any other filling. The orange pulp may be used for the fruit salad. Home-made sweets and drinks are always best. For a novelty make little animals out of toffee. The small celluloid shapes can be bought for one penny. Cut these in halves and grease well, and when the toffee has cooled a little, pour it in. Chopped nuts and cocoanut may be added for variety. Birthday presents loaded in amusing little carts driven by quaint animals cause much pleasure. These can be made at home in a few hours and cost practically nothing. The only materials required are cardboard boxes, pickle corks, a few pieces of three-ply wood or deal for shafts and axles, paint and glue. The cart is the lid of a chocolate box, measuring about 5in. x 3in. A strip of cardboard with the ends bent over is fitted for the driver's seat. Axles are made from the wood 4in. long and the shafts of the same, nailed or glued to the axle. Pickle corks cut in halves form the wheels. Cut small circles of cardboard and nail through these when attaching the wheels, as the corks break away easily. Do not fasten too tightly or they will not rotate properly. Paint the cart inside and out with red paint, wheels are gold. Paint wheels, axles, etc., before fixing to cart. The horse is cut out of strong cardboard, painted and fastened to cork stands. Suitable designs can be traced from picture-books. Quite a number of different designs may be made. For a small children's party it is neither necessary nor desirable for the guests to dress in party finery. A dainty everyday frock is more appropriate for the occasion. Many a child's afternoon has been spoilt because the mother's warning of "You mustn't play and get your pretty frock dirty," was ringing in her ears.

DRESSMAKING.

[Mrs. E. J. Francis, Wirrabara.]

Dressmaking is an art every woman should try to accomplish, even if only in the simpler forms. Besides the joy of creating the garment, perhaps designing it to suit personal tastes, there is the satisfaction of money saved. Once the essential seams and measuring are mastered, dressmaking will be a pleasure.

The greatest aim in dressmaking is to make a simple dress beautiful by expressing simplicity, style, and personality, and to master dressmaking, one must start with a plain garment, learning to cut, fit, and assemble so that the lines will harmonise and suit the individual. The paper patterns that come with the various fashion books are a great help to the home dressmaker, but as these are only made in stock sizes it is often necessary to alter them to suit other measurements. The chief essential in dressmaking is accuracy, and it is necessary to know how to take measurements and to alter patterns to correspond. Time spent at this stage is amply repaid in the finished garment. When taking bust, hip, waist, and armhole measurements be careful not to draw the tape too tightly, as these measurements must be "easy." A good plan is to place the tape just tightly enough to place a finger between tape and figure.

No one fashion can be relied upon to suit every type of figure, but it helps in suggesting and gives an idea of the prevailing fashion; so when accustomed to the outlines of the pattern, alter the style if necessary to suit the figure. A very little alteration may make it more becoming.

When contemplating a new dress think first of the occasion on which it will be worn, then buy material and pattern to correspond. Before cutting out the garment be sure that the measurements are right, and make any alterations in the pattern before placing it on the material. When alterations are done, place the pattern carefully on the material, pinning it into place, and cut carefully, allowing ½in. to 1in. for seams, according to the desired finish. Mark all notches, as these are a great help in making up the garment.

Pin or tack together first the shoulder dart and seam, then skirt to bodice, then side seam, and try on, as any slight alterations are easier to do before the stitchings are done. If the material is apt to fray or stretch out of place, run a thread around the neck and armholes to keep in shape. When cutting striped material, care should be taken not only in placing the pattern on the material so that the stripes match, but also the effect of the stripes on the figure. When a seam is made slightly on the bias, the stripes meet at an angle or V, and a broad V will have a broadening effect, while a narrow V will tend to slenderise. Care must also be taken in cutting figured material to keep the design as unbroken as possible, so it is best to choose a pattern with few seams. Before cutting chiffon or georgette, it is helpful to pin or tack the material to paper, place the pattern on the material, and cut through both material and paper.

It is advisable to shrink all materials before cutting, as in pressing a damp cloth should be used, and if not shrunk beforehand, material will shrink where the heaviest pressing is done, causing puckers to appear. Linens or any washing material may be dipped in water and hung dripping wet on the line by one selvedge. When dry, roll or fold carefully, pressing out any peg marks. Woollens may be shrunk with a damp cloth and a hot iron. Place material right side down, then cover with damp cloth and go over lightly with a hot iron; repeat this process until the length of material is done, wringing the cloths each time to ensure uniform dampness and to prevent puckers.

A flat seam is better for most tailored garments; it lies flatter and sets better. There are several ways of finishing a flat seam according to the material. Flannel or a material that does not ravel may be pinked out or left plain, but one that ravels should be turned back at the edges and stitched or over-sewn with linen or light-weight woollens. The edges may be stitched or sewn together. Material bound buttonholes are usually bound with the same material as the garment, but if used as trimming, braid, silk, or contrast may be used. Before applying the binding, an interlining, either of calico or lightweight canvas, should be placed between the two thicknesses to give added strength. A piece of material about 2in. wide and of a length to permit it to extend ½in. to ¾in. each end of the buttonhole opening will be needed. Press well;

1935 CALENDAR 1935

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1936 CALENDAR 1936

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● FULL MOON

press all seams as they are done, always pressing lengthwise of the seam. Instead of pressing seams in velvets or woollens having a nap, steam them open by running them over the edge of an inverted iron that has been covered with a wet cloth.

A garment that has been well pressed in the making will need very little pressing when finished.

PASTRY.

[MRS. BURY, Wilmington.]

There are three kinds of pastry:—1. Short crust, so called because it is short or crumbly when cooked. It is used for Cornish Pasties, Black Currant Tarts, Macaroons, etc., and all fruit pies except Apple Pie. 2. Flaky pastry, so called because it appears in flakes or layers when cooked. It is used for Tarts, Apple Pies, and all Meat Pies except Cornish Pasties. 3. Suet crust is made with Suet or Shortening, and is used for boiled puddings, boiled dumplings, &c.

SOME RULES FOR MAKING PASTRY.

1. Pastry should be made in a cool, airy place, put on a clean, cold oven slide and cooked in a hot oven.

2. See that the oven is hot for flaky or short crust, and the saucepan of water water boiling for suet crust.

3. Sift flour, salt, and baking powder, to remove lumps, to mix thoroughly and to enclose the air for short crust.

4. Rub fat or butter into flour with the tips of the fingers, raising fingers out of the flour so that air may mix with the flour as it falls.

5. Handle pastry as little as possible, but lightly and quickly.

6. Do not knead short or suet crust; use as little water as possible—the dough must be stiff and in one lump.

7. Make dough for puff pastry fairly moist, and knead it well before adding the fat.

8. When sprinkling board and rolling-pin, use just sufficient flour to prevent dough from sticking.

9. Roll pastry with a firm, even pressure away from you—never sideways.

10. When cutting pastry, make a clean cut; leave no ragged edges.

11. Pastry should not be put over the contents of a pie whilst it is hot; the steam makes the under layers of pastry sodden.

12. While pastry is in the oven open the door very seldom; never within the first five minutes.

13. Small holes should be made in pastry that is the covering of meat pies, to allow gases from the meat to escape.

For short crust half S.R. flour and half plain makes the nicest pastry, as follows:—¼lb. plain flour, ¼lb. S.R. flour, ¼lb. fat or butter, pinch salt, and 1 gill water. Sift flour and salt and rub fat into flour with tips of fingers. Mix into a stiff dough with water, place on a lightly floured board, and roll into shape required.

Cornish Pasties.—½lb. steak, 2 small potatoes, 1 small onion, and 1 slice of turnip, ½ teaspoon salt, ½ teaspoon sugar, 10 shakes of pepper or ¼ teaspoon. Cut meat and vegetables into fine dice, add pepper, salt, &c., and mix well with a little water and a little flour. Bring to boil to thicken and set aside to cool. Cut the short crust into rounds the size of a saucer. Put a large spoonful of the mixture on to each round, wet half side with milk or water and fold over and shape pastry into a half-moon; pinch the edges into a frill. Prick with a fork to allow steam to escpe. Glaze with a little milk mixed with yolk of an egg. Place on a cold oven slide and bake in a hot oven about 20 minutes. Serve on a hot dish, and garnish with small sprigs of parsley.

Puff Pastry.—½lb. plain flour, ½lb. hard butter, pinch salt, squeeze of a lemon, less than quarter of a pint of water; sift flour and salt and add lemon juice mixed with water, and mix into stiff dough not too dry or too wet. Roll out twice as long as wide. Squeeze all water out of butter with a cloth. Place on one-half of paste and fold over the other half, and press edges together. Roll out into an oblong, fold in three. Repeat this three times, allowing 10 minutes between each folding and rolling. The object of cooling between the rolls is to keep the butter and flour distinct and in separate layers. Roll out and cut into tarts or whatever is required. Glaze with yolks of egg and milk.

For sausage rolls, roll out much thinner than for tarts. Mince the meat and mix with pepper, salt, and a little sugar and just a little water and flour to thicken. Bring to boil and set aside to cool. Take about 1 teaspoon of meat and put on pieces of pastry twice the size of meat. Wet one half side and fold over the other side, showing the cut side. Glaze with milk and egg, put on cold slide, and bake in a hot oven 20 minutes.

Sultana Slices.—Make ½lb. short crust to which has been added 1 tablespoon sugar. Roll out about 12in. square, mark half with back of knife and spread with the following mixture:—2 tablespoons sultanas, ½ tablespoon spice, 1 tablespoon sugar, and 1 dessertspoon warm water and a few drops essence of lemon. Blend well and cover half the paste with the mixture; fold over and bake in a fairly quick oven until golden brown. When cold cut into squares.

Delegates at the Women's Session of the Upper North Conference, Booleroo Centre, 17th July, 1935

TRAINING AND CARE OF CHILDREN.

At the meeting of the Warcowie Branch, held on 16th April, Mrs. E. Jarvis read a paper on the above subject. She said:—The training of the child should begin in early infancy. The child should have good nourishing food and be fed regularly, and as soon as it can sit up be given something to play with. From infancy onwards a child needs careful attention, or otherwise it may form bad habits. As soon as the child can ask for what it wants, it should be taught to say please and thank you and wait patiently for it. Children should go out of doors to play as much as possible. Some seem to be more destructive than others. It is the parents' duty to teach them to build up, rather than destroy. Most children are selfish, and it is the parents' task to teach them not to be greedy.

Parents must be firm; never allow the child to "answer back," nor have all its own way. Some children are hard to manage, needing a firm hand to bring out the best in them, whilst others need gentle handling. Some children are afraid of the dark, and should be pitied, but never punished. Mothers should try to show such children that their fears are groundless; and encourage them, rather than scare them. Teach them to be honest and to do a deed of kindness for others. It helps them to be unselfish. When a child reaches the school going age, it must be taught to join in and play games with other children. As the child grows, he should be given some work to do at home. Parents should if necessary, sacrifice some of the pleasures of life to help their children achieve his or her life's ambition. (Secretary, Miss L. Martin.)

JAM COMPETITION.

Twenty-three members attended the meeting of the Penola Branch held on 1st May, which took the form of a Jam Competition. Mrs. R. Black judged the entries and made the following awards:—First and second, Mrs. T. Oswald; third, Mrs. J. Neilson. (Secretary, Mrs. Edith Kidman.)

FANCY WORK.

''Fancy Work'' was the subject of the paper presented by Miss L. Martin at the May meeting of the Warcowie Branch. ''The blending of the colours,'' she said, ''and neatness are the two main factors to remember. Neatness depends largely on the kind of cotton and needle used. Always use a fine needle. The kind of cottons will vary with the material being worked. For light weight materials, linen or cotton stranded gives the best result. Poplin looks nicer worked in a silky thread. There are numerous stitches to choose from, but the following list is suitable for various patterns:—

Chain stitch for initials, filling in and sometimes stems or lines.

Stem stitch for stems, but can be used for ''blocking'' initials or outlining.

Cross stitch very seldom used, except on patterns printed purposely for the stitch.

Satin stitch for filling in leaves and petals of flowers. Instead of always working the stitch the full width of the leaves or petals, a long stitch and then a short stitch can be worked. This looks very effective, [illegible] a pattern which may look clumsy if worked in the usual manner.

Lazy Daisy for flowers and leaves.

Buttonholing for flowers, especially those [illegible]unculus or Hollyhock designs. By working from the centre o[illegible]re a vein is formed down the centre.

French Knots mostly used for centre [illegible]

Worm stitch, the same as 'French Knots,' [illegible]used instead of a short one. This is used for Rosebud designs and can a[illegible]r Lazy Daisy. For single Lazy Daisy one stitch is all that is necessary. These are joined in such a way as to form a loop.

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to remove lumps, to mix
fingers, raising

Never use double thread nor a crewel needle. The double thread is apt to tangle and spoil the appearance of the work. As the eye of a crewel needle is larger than the point of the needle, one is likely to fray or break the thread while trying to pull the needle through the stitches wound on the needle point. The size of the 'Long Knots' varies according to the number of twists on the needle. The whole effect of an article is often spoilt by an unsuitable edge. The depth of the edge should vary with the size of the garment. For example, from a narrow edge for a d'oyley, to a deep lace for a supper cloth.''

SIDE LINES.

The Hon. Secretary of the Yurgo Branch (Mrs. R. Sanders) read a paper at the meeting held on 1st July.—Any member of the family can lend a hand with the vegetable garden, and it is an asset to the home to have fresh vegetables daily. When there is more than needed, they can be used up in pickles, preserves and sauces. Again they can be sold to the store or neighbours, and so help to bring in a few shillings.

The fruit garden needs the attention of an experienced man who understands pruning, ploughing and mulching, but anyone who is able to have a fruit garden is well repaid for this trouble by having the pantry filled with jams, jellies and preserves. Even with only a few trees, I have not, for the last two years, bought one tin of jam or a bottle of preserves.

POULTRY.

Poultry raising is a profitable sideline. Fowls are easily reared on a farm, and when allowed to roam, need very little to keep them. To get the best results, however, poultry should have a hot bran and pollard mash in the mornings, shelter from cold winds in winter and also shade in summer. Gather the eggs daily in winter, twice in summer where exposed to the sun. Send them to market fresh and clean to get best results. Ducks are very easy to rear and sell well for table use, but do not pay to keep for egg laying. The Muscovy-Pekin makes a good table bird, and the lighter breeds such as Indian runner Kah-ki Campbell, are the best laying strains. Turkeys are more delicate, the first month they want a sheltered place where the sun shines early in the morning, and must be fed well. Stale bread soaked in milk and mixed with pollard and a little bran until crumbly for the morning feed, and crushed wheat during the day makes a suitable feed. The best months to hatch are July, August and September. July hatched birds should be ready for Christmas market; August and September hatchings should be sold at Easter. Once a turkey is full grown, send it to market.

Cows are disliked by nine out of ten people on the farm, although the products from them almost equal the half of one's living, when it is realised how many dishes can be made from milk, butter and cream. This is work a woman or girl can do better than most men. Cows should be the very best that it is possible to buy. Always leave the calf two days with the mother, the first milk is very beneficial and necessary. When the calf is taken away, have it right out of its mother's sight, she will soon forget it and settle down to her duty. The calf should be fed two or three days on new milk, and the latter gradually mixed with separated milk. By the time it is a fortnight old it will do on separated milk with a little linseed added with hot water. Never feed calves on cold milk. Unless it is intended to keep these young animals, market them at about 2 months old, right off the milk.

Pigs.—Where cows are kept pigs are necessary to use up waste milk, and all scraps. This is not a woman's or girl's work. Where a number of these animals is kept the feeding of them is too laborious for the women-folk. The farm is not complete without a pig, and all women should know how to cure a pig for bacon, and have a supply ready for winter months. This item again saves the farmer still more expenses.

CLARE.

The April meeting was devoted to "Jam Recipes," 30 members being present. Each member exhibited a sample of jam or jelly together with its recipe.

On 4th May, 33 members took part in a "Lend a Hand" afternoon. Knitting difficulties, smocking, mesh work, &c., were some of the topics discussed. (Secretary, Mrs. A Pollock.)

THE TOMATO AND ITS USES.

Mrs. Stewart read a paper on this subject at the April meeting of the Taplan Branch:—The growing of successful crops of tomatoes, at one time so easy, of late in many districts has become quite a difficult matter, owing to the presence of so many diseases. The most destructive disease of tomatoes is "Tomato Wilt." The effect is the destruction of foliage. Healthy plants suddenly collapse and the leaves shrivel. This can be prevented by regularly spraying the plants every fortnight with Bordeaux mixture. They should be sprayed from the time of planting until the fruit is ready to pick. In the beginning of September sow seeds of Early Red and Early Dwarf, and they should be ready for planting out about six weeks later. With favourable conditions one should be pickling tomatoes a week before Christmas. If the soil has been used before, dig up a few months beforehand. A little lime and wood ash helps to sweeten the soil. When the plants were put in, the roots were dipped in a weak solution of Condy's crystals, and a tiny pinch of sulphur placed in each hole. This has given wonderful results. Staking the plants is quite a good plan. In districts of hot climate, plenty of foliage must be left to prevent the sun from burning the fruit. For stakes, good stout sticks, 4 or 5 feet out of the ground are necessary. As they grow, the leading shoot should be tied with some soft material, such as raffia. The branches that grow from the axis of the leaves should be pinched off as they appear, and this will keep the plant to one main stem. As soon as it reaches the top of the stake, pinch off the top. This will throw the plant into bloom and induce a good setting of fruit. While the plants are young, they do not need too much water, but when the fruit has set water can be applied more liberally.

POULTRY AND COWS.

Following the discussion on the above paper, Mrs. Clarke, in the course of a paper "Poultry in Conjunction with Cows" said:—"Next to the garden, of all things amongst the ouside work connected with the farm, poultry and cows have most appeal for women. Not only does it mean a great help for the men, but it is also the main source of ready cash, and, indeed, it would be very hard with the women folk if they had no cream or egg money to rely on.

The most profitable way of utilising skim milk is to give it to fowls, either in the early morning mash or fed separately in the form of thick milk. Especially is it good for growing turkeys. Commence operations with a reliable strain of birds. Careful selection of males should be made, for it is from them and not the hens that the progeny depends. Pure bred White Leghorns are best, and these should be procured from a reputable breeder. It is no use breeding table birds, the markets are too distant and freight would swallow up all the profits. If a utility fowl is required, then the Black Orpington is the one to select, or Australorps if obtainable. To get the best out of poultry, it is absolutely essential to have a pure strain, whatever the breed; 50 pure bred birds are far better than 100 mongrels. Cull heavily, and breed a couple of hundred birds per year. One can safely count on a half being roosters, and allowance must be made for many deaths amongst the chicks. One will be very fortunate to secure and rear 60 pullets from the original 200 chicks.

Eggs should be collected at least twice daily, any soiled ones wiped immediately with a damp cloth, and packed ready for market, big end up. Only by this method can one hope to get the top market value for eggs, which is usually anything from 2d. to 4d. per dozen more for export standard.

Early moulters should be discarded and either sold or fattened for the table. These are not winter layers, and it is no use breeding from them. It is the hen that is just beginning to moult and the ones that are still half naked that are the layers, and are probably laying right through the moult. It takes a hen six or eight weeks to get over the moult before she starts laying again, and the late moulter starts just as soon as the early moulter." (Secretary, Mrs. Flynn.)

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			WOMEN'S.	
Rendelsham	3/7/35	7	Question Box	Mrs. Z. A. Bignell
McLaren Flat	4/7/35	16	Demonstration	Mrs. B. Powell
Sheoak Log	2/7/35	29	Address—" Needlework " —Miss Mortimer	Miss K. Koch
Wirrabara	16/5/35	24	" Dressmaking "—Mrs. Francis	Mrs. A. Curtis
Wirrabara	20/6/35	27	Curio Afternoon	Mrs. A. Curtis
Balumbah	3/7/35	14	Replies, &c., Stock Ailments—H. D. Adams	Miss H. Jericho
Clare	6/7/35	35	Annual Meeting	Mrs. A. C. Pollock
Wilmington	11/7/35	35	Annual Meeting	Mrs. P. Cole
Belalie	9/7/35	29	Annual Meeting. Quilting Demonstration—Mrs. Orchard	Mrs. E. L. Orchard
Narridy	11/7/35	42	Social	Miss B. J. Reynolds
Nelshaby	10/7/35	20	Annual Meeting	Miss A. M. Lawrie
Snowtown	4/7/35	18	Annual Meeting	Mrs. A. Hocking
Maltee	4/7/35	7	Annual Meeting	Miss L. Bassham
Tantanoola	3/7/35	12	Annual Meeting	Mrs. Gus. Altschwager
Monarto South	18/7/35	23	Annual Meeting	Mrs. F. W. Liebelt
Karte	30/5/35	—	Inaugural Meeting	Mrs. F. N. Atze
Karte	14/6/35	—	Social	Mrs. F. N. Atze
Karte	10/7/35	19	" Biscuit Day "—Mrs. Atze	Mrs. F. N. Atze
Penola	3/7/35	26	Butter Competition. Judge—W. H. Downes	Mrs. F. J. Kidman
Morchard	23/7/35	—	Combined Men's and Women's Branch Social	Miss F. A. Brown
O'Loughlin	16/7/35	9	Annual Meeting	Mrs. E. E. E. Lutz
Laura Bay	9/7/35	11	Annual Meeting	Miss T. E. Barnett
Wirrabara	18/7/35	14	Conference Report	Mrs. A. Curtis
Kybybolite	11/6/35	13	" Rug Making "—Mrs. Harrison	Mrs. W. D. Kekwick
Kybybolite	16/7/35	9	Annual Meeting	Mrs. W. D. Kekwick
Kangarilla	18/7/35	11	Annual Meeting	Mrs. M. A. Steer

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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS

Agricultural Bureau Conferences—1935.

Murray Lands (East), at Alawoona, Tuesday, October 1st (A. J. Pengilly, Secretary).

Eastern Eyre's Peninsula, at Butler, on Tuesday, October 8th (C. F. Jericho, Secretary).

Lower Eyre's Peninsula, at Yeelanna, on Wednesday, October 16th (R. R. Wilson (Secretary).

Central Eyre's Peninsula, at Wudinna, on Friday, October 18th (W. P. Bartley (Secretary).

Fruit (Non-irrigated), at Lyndoch, Tuesday, November 5th (J. S. Hammat, Secretary, Williamstown).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Laura, Wednesday, September 25th.
Eudunda, Wednesday, September 25th.
Gawler, Saturday, September 28th.
Balaklava, Saturday, September 28th.
Waikerie, Saturday, September 28th.
Karoonda, Wednesday, October 2nd.
Streaky Bay, Wednesday, October 2nd.
Murray Bridge, Friday and Saturday, October 4th and 5th.
Cleve, Saturday, October 5th.
Kapunda, Saturday, October 5th.
Peterborough, Saturday, October 5th.
Kadina, Saturday, October 5th.
Jamestown, Wednesday, October 9th.
Loxton, Wednesday, October 9th.
Strathalbyn, Wednesday, October 9th.
Penola, Wednesday, October 9th.
Yorketown, Wednesday October 9th.
Blyth, Saturday, October 12th.
Moonta, Saturday, October 12th.
Pinnaroo, Wednesday, October 16th.
Saddleworth, Wednesday, October 16th.
Mount Remarkable, Wednesday, October 16th.
Maitland, Wednesday, October 16th.
Kingston, Saturday, October 19th.
Clare, Saturday, October 19th.
Minlaton, Wednesday, October 23rd.
Mount Gambier, Wednesday and Thursday, October 23rd and 24th.
Burra, Wednesday, October 23rd.
Lucindale, Saturday, October 26th.
Southern, Port Elliot, Saturday, October 26th.
Tatiara (Bordertown), Wednesday and Thursday, October 30th and 31st.
Millicent, Saturday, November 2nd.

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Agricultural Shows—*continued.*

Kingscote, Thursday, November 7th.
Oakbank, Saturday, November 9th.
Kalangadoo, Saturday, November 16th.
Angaston, Saturday, February 29th, 1936.
Mundalla, Wednesday, March 4th, 1936.
Mount Pleasant, Thursday, March 19th, 1936.

AGRICULTURAL INQUIRIES.

[Replies supplied by Mr. R. C. SCOTT, Supervisor of Experimental Work.]

Californian Cape Barley for Malting.

Pygery Agricultural Bureau asks: "Is Californian Cape barley a suitable crop for the Pygery district and what is its quality for malting?"

Reply—The opinion gained as a result of a series of experiments with Californian Cape barley is that a district with mild finishing conditions is necessary if good quality grain is to be harvested. This means that if we are to obtain a Cape barley capable of competing on the English market, we will be more or less confined to those districts which are known to produce good malting grain at the present time. Generally speaking, these districts are situated on Yorke Peninsula, Southern Eyre's Peninsula, south of Adelaide, Kangaroo Island, and the lower South-East. Consequently, it is not likely that the average rainfall and climatic conditions of the Pygery district will be suitable for the production of Californian barley of value for malting purposes. It might be added that there is practically no demand by Australian maltsters for this type of barley, but on the other hand large quantities are imported into England from California and North Africa for blending with the English Two-Rowed barley. Consequently, the object of the trials has been to ascertain whether we can produce barley capable of participating in this trade.

Kherson and Ideal Oats.

Blackheath Agricultural Bureau asks: "Are the oats Kherson and Ideal the same, and is Kherson a good hay variety?"

Reply—Kherson and the Ideal Grazing oat are different varieties. The former is an early ripening oat selected from Kherson, a Russian variety. This selection was made at Roseworthy Agricultural College and is usually known as Early Kherson. It is a heavy stooling oat with fine straw, but is not very tall growing. However, it is a variety capable of heavy yields of good quality hay. The Ideal Grazing oat originated in Victoria as the result of a selection made by a farmer in that State, but no particulars regarding its history are available.

Late Seeding of Cereals.

The Secretary of the Blackheath Agricultural Bureau reports that a member has 25 acres of fallow too wet to drill. Is it advisable to sow a cereal crop so late in the season?

Reply—It is now too late to recommend the planting of a cereal crop and the land should either be treated as fallow in preparation for wheat in the coming season or planted with Sudan grass for grazing purposes. If the latter course is adopted, it naturally means that livestock must be available to utilise the fodder produced. The best time to plant Sudan grass is as soon as the danger from frost is past, and in this case toward mid-September will probably be the most satisfactory. The grain may be sown through every hoe of the drill at a rate of about 12lbs. of seed per acre, together with approximately 1cwt. of superphosphate.

Ensilage v. Chaff for Sheep.

Yadnarie Agricultural Bureau asks: "Which has the higher feeding value for sheep—ensilage or oaten chaff?"

Reply—For lambing ewes ensilage is to be preferred to oaten chaff, as it practically takes the place of greenstuff so far as the production of milk, development of the lamb, and delivery of the lamb is concerned. On the other hand, for the maintenance of the flock during times of drought oaten chaff is more easily handled and is to be preferred. The amount of each required to supply the requirements of a fully grown sheep will vary according to the quantity of roughage in the field. If little other feed is available, 1½lbs. to 2lbs. of oaten chaff or 4lbs. to 4½lbs. of ensilage per head per day is necessary. On the other hand, if other picking can be obtained, these figures may be approximately halved.

Lucerne Flea.

"Wolseley" asks for treatment for lucerne flea control.

Reply—Lucerne flea may be destroyed by spraying with a lime sulphur solution made up at a strength of 1gall. lime sulphur to 60galls. of water. The lucerne should be grazed or cut and then treated with the solution, choosing a bright sunny day for the purpose if possible. Approximately 100galls. will be required to dress an acre of land. The time of application is most important, and the first treatment should be given shortly after the first hatching in autumn, which is usually in April or May, according to the season. You then destroy the insects before they have commenced to lay, but at the present time there are numerous eggs in the ground at various stages of incubation, which the spray cannot affect. Consequently, repeated sprayings at about three-weekly intervals are necessary to keep the pest under control. With the approach of warmer weather, hatching ceases and the fleas disappear, but in future years a watch should be kept for their appearance in late autumn or early winter and the first spraying given a week or so later.

Subsidised Bulls.

Replying to the Secretary of the Chandada Branch of the Agricultural Bureau, who asked for information concerning the purchase of subsidy bulls, Mr. P. D. Jeffrey (Chief Clerk of the Department of Agriculture) says when once the buyer decides from whom he will purchase, and which bull he wants, the Department will supply forms of declaration for both the seller and the buyer to fill in and sign. When the declaration forms are returned to the Department arrangements will be made for the tuberculin test of the bull and the type and valuation examination. It will also be necessary for the bull to be accepted for herd book registration, and that he is from a dam which, under official test, has produced the required amount of butterfat. When the Department is satisfied that the bull thus meets all requirements of the regulations, it will forward the first instalment of the subsidy to the buyer.

TRAVEL SERVICE.

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Black Cherry Aphis.

"Kalangadoo" reports that cherry trees in his garden are attacked by black aphis.

Mr. A. G. Strickland (Deputy Chief Horticultural Instructor) in reply, says black cherry aphis is closely related to the green peach aphis, and overwinters in the egg stage among leaf and fruit buds. A winter tar distillate spray, applied in late June or July, will destroy such eggs and prevent or considerably reduce the potential spring hatching. Tar distillate may be obtained from leading spray manufacturing firms, and the strength at which each particular brand should be used (usually about 30 per cent.) will be found on the container. It should be noted, however, that the season is now too far advanced to permit the use of this winter spray; it may only be applied whilst trees are dormant, and if used at this juncture would be liable to seriously injure trees. Keeping in mind for next season the fact that a dormant spray as above indicated is the most effective means of reducing the spring infestation, this may be controlled to some extent by periodic spraying with white oil emulsion or nicotine sulphate (40 per cent.), 1¼ pints in 80galls. (plus 3lbs. soap).

Sodium Chlorate for Killing Weeds.

Replying to a correspondent at Mannum, who asked for information concerning the use of sodium chlorate for killing weeds, Mr. R. C. Scott (Supervisor of Experimental Work) said the sodium chlorate solution used for the destruction of weeds is usually made up at the rate of 1lb. of sodium chlorate to 1gall. of water. This is sprayed over the foliage of the plants and the effect is noticeable within a few hours. The above ground growth is usually totally destroyed at the end of 7 to 10 days, but the period before the plants die depends upon the age and class of plants being treated. In the case of a well-established stand of a weed, such as Convolvulus, which has underground stems, it may mean four to five applications spread over a period of about two years before all plants are completely destroyed, whereas annuals with fleshy leaves may be destroyed by a single treatment. Therefore, much depends upon the type of plant which it is desired to eradicate. However, provided that the treatment is both thorough and regular, there is no doubt that sodium chlorate is effective in destroying deep rooted and persistent weeds.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

Strathalbyn Branch asks: "What is the earliest age at which lambs can be dosed for worms?"

Reply—Usually lambs do not require drenching before they are three months old, but in some cases it may be necessary to drench earlier if they show symptoms of scouring, anaemia, or swelling about the lips, which symptoms are indicative of internal parasites.

"Lenswood" reports cow, due to calve in a month, having partly lost the use of her hindquarters.

Reply—Place in a well-bedded stall. Procure from a chemist 4ozs. fused calcium chloride. Directions for use:—Dissolve 1oz. in cold water and give as a drench night and morning for two days. Feed on plenty of green feed and also give dry feed as follows:—Bran, 4lbs.; oats, crushed, 4lbs.; chaff, 12lbs. In the dry feed put 3ozs. of the following mixture twice a day:—Superphosphate and common salt, equal parts.

Koppio Branch asks: "Whether the killing of trees, yaccas, &c., with weed killer would have any ill-effect on stock running in the paddock while foliage is drying or wilting?"

Reply—Weed killer solution usually contains arsenic in its most dangerous form, and it would be extremely dangerous to the health of stock to allow them to have access to herbage which has been treated with such solution. This Department has recorded several instances where the deaths of stock have resulted from their getting access to herbage that has been some time previously treated with arsenical weed killer solution.

"Kulde" reports sheep with colds. They cough a good deal and some have died.

Reply—It would appear that your sheep are infested with lung worms. There is usually no difficulty in detecting the presence of these parasites on making a *post mortem* examination on a dead sheep if you split open with a knife or pair of scissors the bronchial tubes right down to where they divide into a series of small tubes branching off into the lung tissues. There is no remedial treatment for these parasites, though liberal feeding of the sheep to sustain their strength will help considerably in combating the ill-effects of these worms. As a rule, where sheep are infested with the lung worm, they are, at the same time, infested with other stomach and intestinal worms, though, as these are small in size, they are not so readily detected. Drenching the sheep will help considerably to reduce the degree of infestation with these and so give the sheep a better chance of keeping up against the lung worms. If, therefore, on making a *post mortem* examination you do find the lung worm, I would recommend you to drench the sheep and see that they are liberally fed. There is no need to starve the sheep before dosing them. (The Stock and Brands Department has available a leaflet giving instructions for the above drenching.)

"Marama" reports a foal blind during night, although its sight is normal during the day.

Reply—The condition of "night blindness" may be associated with general systemic weakness, in which case building up the animal's strength may effect an improvement. The condition may also be associated with diseased condition of the lens or retina (*i.e.*, the curtain at the back of the eye on which the rays of light fall) of the eye itself. In such case, treatment is hopeless.

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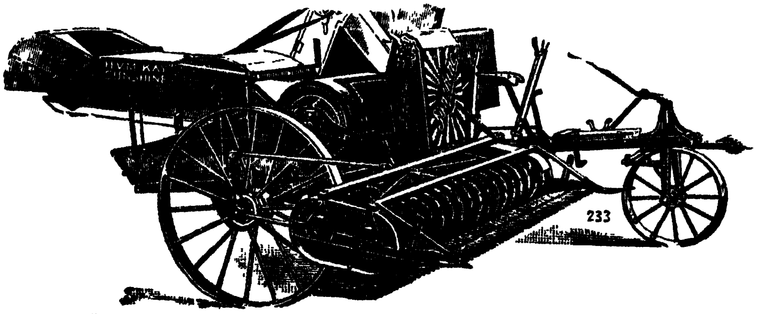

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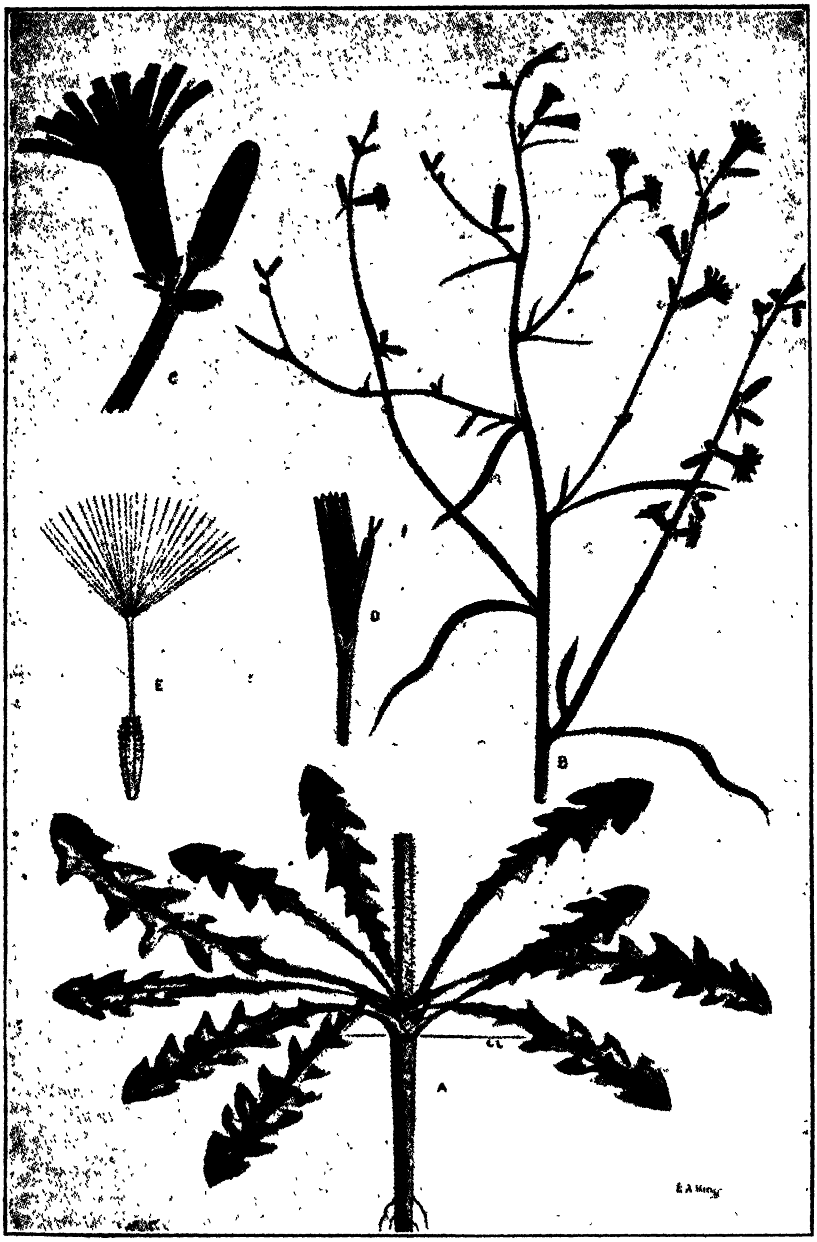
SKELETON WEED (*CHONDRILLA JUNCEA*, L.); A POTENTIAL MENACE TO THE SOUTH AUSTRALIAN WHEAT FARMER.

[By G. H. Clarke, B.Sc., Botanist at the Roseworthy Agricultural College.]

As far as is at present known, Skeleton Weed does not yet occur in Australia outside of New South Wales, but there is every possibility that it will make its appearance sooner or later in this State if very strict precautions are not taken to guard against its introduction. The importation of seed wheat, or of other material likely to contain foreign seeds, from districts where the weed is bad, offers perhaps the most likely method of entry, but the spread of the weed in a westerly direction from seed carried by floodwaters is also to be anticipated, so that its future presence in the Murray Mallee area is far from improbable.

The serious view which is being taken with regard to this weed is indicated by the fact that, at the present time, a reward of £5,000 is being offered by the New South Wales Government in return for a practicable method of its eradication from the wheat lands of that State. The first record of its naturalisation was in 1917 at Marrar. Since then it has come to occupy extensive areas throughout the Riverina and South-western slopes of New South Wales. The plant is a native of Europe, throughout which it has a very wide range, and from which it has been introduced into parts of America. In both countries it is known by such names as "Gum Succory," "Skeleton Weed," and "Naked Weed." It is essentially a weed of cultivated ground, and it seems to thrive best under conditions where the method of bare fallowing is practised; hence the serious nature of the pest to the Australian wheat farmer.

Unfortunately, during its earlier stages of growth, Skeleton Weed does not differ greatly in habit and appearance from a number of other members of the Chicory tribe (*Cichorieae*) of the *Compositae*, the family to which it belongs. Species of Dandelion (*Taraxacum*), Cat's Ear (*Hypochoeris*), Hawkbit (*Leontodon*), &c., and also many *Cruciferae*, have a somewhat similar leaf form in the early or *rosette* stages. On this account young plants of *Chondrilla juncea* are apt to escape recognition, and are liable to be confused with other, and relatively harmless, weeds of similar appearance. In the later stages, however, the plants have a bare, wiry-stemmed structure, which is very characteristic, and to which the names "Skeleton Weed" and "Naked Weed" are due. The same bare appearance is to be seen in the case of old plants of Wild Chicory (*Cichorium Intybus*, L.), which, perhaps, most nearly resembles Skeleton Weed in this respect, though it is coarser, and has much larger heads with pale-blue, instead of yellow, florets. It is worthy of note that the name *Chondrilla* is derived from a Greek word meaning "Chicory," of which the word "Succory" is a corruption, and that both *Chondrilla* and *Cichorium* are members of the same tribe. The specific name *juncea* means "rush-like" (*i.e.*, like *Juncus*, the chief genus of Rushes), and doubtless refers to the broom-like appearance of the full-grown plants. The appearance of Skeleton Weed at different stages of its growth is shown in the accompanying illustrations, all of which have been taken from the August (1935) number of the *Agricultural Gazette* of New South Wales. The two photographs on pages 172-173, showing the plants growing in the field, are from an article in that journal by Mr. C. J. Daley, Sheep and Wool Instructor, N.S.W., in which the raising of fat lambs is suggested as an alternative to wheat-growing on Skeleton Weed country.



[*From N.S.W. Agricultural Gazette.*]

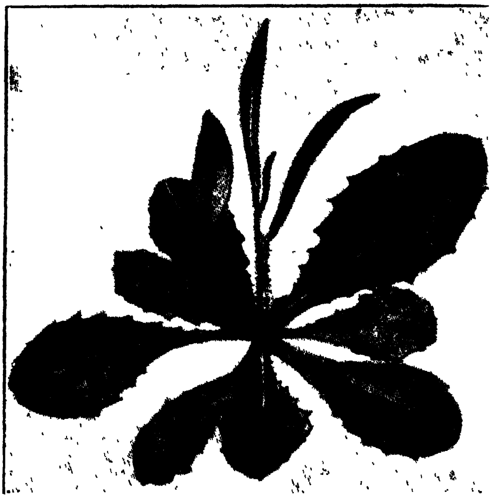
Skeleton Weed (*Chondrilla juncea*).

A—Basal leaves, showing root system and lower part of stem with bristles. B—Portion of plant, showing upper narrow leaves. C—Two unexpanded and one fully expanded flower heads. D—A ligulate floret. E—Fully developed muricated seed with stalked parachute-like pappus.

Botanically, the genus *Chondrilla* is characterised by having flower-heads with an involucre of 8-10 nearly equal bracts arranged in a single whorl, and provided at the base with small herbaceous scales, and with few (7-12) contained florets, and by the cylindrical-oblong fruitlets (*achenes*) bearing, towards the summit, a crown of scales surrounding the base of a filiform beak which supports the pappus of simple hairs.

**Description of C. juncea.*—A deep-rooted biennial or perennial, 15in. to above 3ft. high, erect, glabrous, hispid below, almost leafless when mature, with numerous slender rigid spreading branches; lower leaves sinuate or runcinate, usually withered at flowering, the upper ones entire; heads small, subsessile, solitary or in distant clusters of 2-3 on the branches; involucral bracts linear, somewhat mealy; achenes muricate, surmounted by a small crown of 5 elongated scaly teeth; florets yellow.

Skeleton Weed is troublesome on account of its perennial and extremely vigorous root system, and the fact that its growth is favoured by just those very conditions and farming methods which are most suitable for the production of cereal crops, especially wheat. Growth commences in winter, during which the plants form rosettes of leaves close to the ground. These leaves vary a good deal in shape, but are mostly pinnately toothed or lobed, and often runcinate, that is, with the lobes directed downwards towards the base of the leaf. Later, there is developed an erect branching stem with slender entire leaves and small distant heads of yellow flowers in clusters of 1-3. After flowering the stems become very tough and wiry, and eventually appear almost bare due to the withering of the leaves and bracts, and to the separation of the "seeds" or fruitlets. The above-ground portions of the plant die at the end of the autumn, but, by this time, the root system is established deeply in the soil and is ready to produce new aerial shoots. The rootstock is extremely viable and, even after being broken up by the farming implements, the fragments survive and are capable of giving rise to a new aerial growth Thus, while it may be possible to destroy seedling plants by cultivation, this process has very little eradicative value when the root-system has developed. Under these conditions cultivation merely spreads the weed and increases the density of infestation.



[*From N.S.W. Agricultural Gazette.*]

Skeleton Weed in early stages of growth.

Local and seasonal conditions often result in the basal leaves being narrower and more deeply serrated.

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*Based upon the description by L'abbé H. Coste in his *Flore Descriptive et Illustrée de la France*, Vol. II, Paris, 1903.

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The Band is actually a double trap, as it not only traps the grubs in the corrugations lying immediately next to the trunk of the tree, but a similar number are trapped and killed in the second series of small passages which are formed by the smooth outside section of the Band against the corrugated section.

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While, therefore, the spread of the weed takes place, in the first instance, by seed, subsequent invasion and spread on cultivated lands appears to be due mainly to tillage operations. According to Mr. E. S. Clayton, Senior Experimentalist of the New South Wales Department of Agriculture, it has been observed that, in long narrow paddocks, where the cultivations are all lengthwise with the paddock, the weed is spread lengthwise, not crosswise, and that where the weed occurs on one side only of such a paddock, it is often possible to confine it to that side, despite frequent cultivations and the spread of the plant in a lengthwise direction.

Not only does Skeleton Weed resist ploughing and repeated cultivations, but it can also withstand heavy grazing on stubble and fallow. In its early stages of growth it is said to be greatly relished by sheep and to provide useful fodder, though not, of course, a complete ration in itself. Thus, the raising of fat lambs has been suggested as an economic proposition on land which has become so densely infested with Skeleton Weed as to be unsuitable for wheat growing. The article by Mr. C. J. Daley, already referred to, deals with this aspect of the Skeleton Weed problem.

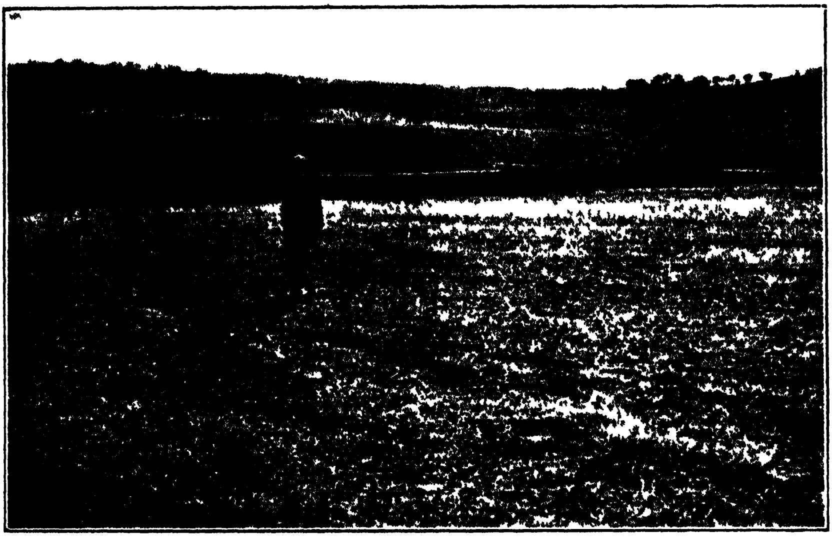
[*From N.S.W. Agricultural Gazette.*]

A paddock of Skeleton Weed in an advanced stage of growth. This rank, unpalatable growth is useless for sheep.

(After C. J. Daley.)

It is believed by some that *Chondrilla juncea* exerts some injurious influence over plants, especially wheat and oats, growing in its vicinity, since such individuals usually appear weak and sickly when growing in and around patches of Skeleton Weed. Whether this is due to the exudation of some harmful substance into the soil, or, as seems more likely, to the deprivation of the crop plants of water and necessary minerals by the more efficient root-system of the weed, is not known. On the other hand, some deep-rooted perennials like lucerne, when once established, appear to be able to compete successfully with Skeleton Weed, the growth and spread of which are not nearly as vigorous on land not subject to frequent cultivations. From their experience at the Wagga Experimental Farm, N.S.W., Messrs. Ross and Taylor are of the opinion that lucerne growing offers a valuable means of controlling the growth of this weed.

The eradication of Skeleton Weed is a problem which awaits solution. While the use of chemical exterminators on a large scale seems to be ruled out by the high cost, amounting to from £4 to £5 per acre in the case of even moderate infestations, it is possible to get rid of small patches by means of chlorate sprays. From the South Australian point of view it is of extreme importance that this weed be recognised early, should it appear in this State, so that eradication can be effected before it has secured a firm footing, and while it is possible to do so with comparative ease and with a minimum of expense. A sharp look out should therefore be kept by farmers in all parts of the State. Any unfamiliar weed, and especially one conforming to the above description, should be forwarded at once for identification, so that eradication measures, if required, can be undertaken in time. In the mean time precautions should be taken to prevent the importation and distribution throughout the State of materials likely to be contaminated with seeds of Skeleton Weed.



[*From N.S.W. Agricultural Gazette.*]

At this stage Skeleton Weed can be grazed with sheep. The land shown in this illustration has been abandoned for wheat growing.

(*After* C. J. Daley.)

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GRASSHOPPER CONTROL.

WORK OF THE RENMARK IRRIGATION TRUST.

The following statement is compiled from a report of the action taken by the Renmark Irrigation Trust to combat the outbreak of grasshoppers which occurred early in 1935.

The Grasshoper Investigation Committee, appointed by the Government and to whom a copy of this report was forwarded, was very much impressed with the work done at Renmark, and at its suggestion a *résumé* of the report is published to show that what was done at Renmark could be followed with advantage in other districts in cases of invasion.

On or about 9th January, 1935, the discovery of a grasshopper egg bed was reported on a property on the Block E settlement. A circular was at once prepared, notifying all farmers of the potential danger, and reference was made to the Noxious Insects Act of 1934, under which it was compulsory for all landholders to search for breeding grounds, and when hatching commenced to follow up with destructive measures. To this circular was attached a reprint of a pamphlet issued by the Department of Agriculture outlining control methods.

On 15th January, Mr. Ingerson, of the Council for Scientific and Industrial Research, addressed a meeting of the Block E Branch of the Agricultural Bureau and spoke on the steps that had been taken in Mildura to combat the pest.

Subsequently, a local committee was formed. On 16th January the committee interviewed the chairman and members of the Renmark Irrigation Trust and urged the introduction of immediate action.

Mr. J. H. M. Price was appointed director to superintend operations, and in the course of a report to the Trust outlined the measures taken by the committee.

DUTIES OF OVERSEERS.

1. The residence of each overseer to be a depot for poison bait.
2. The overseer to see that sufficient bait was always on hand.
3. To see that bait was properly mixed.
4. To inspect all lands in his area.
5. To notify all growers where young hoppers were found and instruct them how to obtain bait and how to spread it.
6. To inform him of his responsibilities under the Act if he failed to comply with the regulations.
7. To warn all growers to remove all livestock from poisoned areas.
8. To enter the name of the occupier of each infested area in a notebook.
9. To keep in touch with each occupier of infested area until such area was cleaned up.

To give each overseer the proper authority to act, each one was furnished with a certificate under the Noxious Insects Act, 1934, by the Renmark Irrigation Trust No. 1, and a copy of the Act was handed to each overseer.

Poison was taken to one of the worst infested areas and a practical demonstration was given in what to look for, how to look for, and how to poison the hoppers. The necessary steps were then taken to insure an adequate supply of the various ingredients for the poison bait. It was decided by the committee to hold weekly meetings for the purpose of comparison.

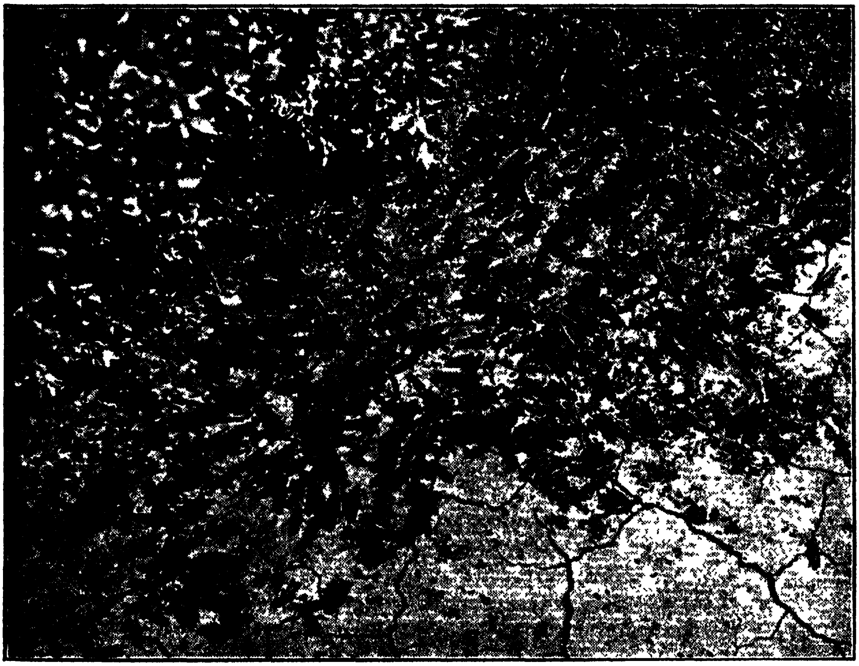
PRESS.

At the commencement of operations it was realised that little could be done unless the committee had the full support of all growers. The aid of the local press was enlisted with the object of breaking down the apathy which was inevitable. On several occasions a reporter was taken on the full round of the overseers, existing conditions pointed out, and stress laid on the fact that little good could be done unless all co-operated. Fortunately the reporter realised the position and rendered great assistance, with the result that the work was to a great degree simplified.

MEETING OF OVERSEERS.

Comparisons of methods were discussed and the following system was agreed the best and so adopted by all overseers. The method was as follows:—

Upon learning that a ground was infested the name was placed in a book kept for the purpose, this book being ruled into columns, with the days of the month numbered at the top of each column. The date of discovery was marked off with a cross; in the folio it was marked as to condition of infestation, light, heavy, or medium, &c. The grower was then instructed when to call again for poison and when he did so a further cross was made in the date column. It was thus a simple matter to ascertain if growers were standing up to their obligations. If it was found that a grower was negligent—and it was quite a simple matter to do this by glancing down the date column of the book—then that grower was called upon and the seriousness of his neglect pointed out to him and a polite warning given.



Plague Grasshoppers in the Wingless Stage. (Note character of soil surface).

Discussion also took place on the habits of the young hoppers. It was readily agreed that the poison was doing a very satisfactory job, and gratification was felt at the success already achieved.

POSITION DURING SECOND WEEK.

A rather alarming increase was reported in the quantities of hatchings over all areas, but the results and experience gained during the first week gave the overseers confidence in the means at their disposal and they fairly revelled in their tasks. One of the worst areas encountered, a paddock of 10 acres, was very badly infested; in fact at one end it was simply a seething mass. In this case the pest was burnt off off and poison laid every day for over a week before the position showed signs of improvement. Over the whole of the area this week provided the crisis and when the strength of the poison was increased, more definite results were gained. During this week the work of the overseers was very heavy, and it is to their credit that each man stuck to his task when things were not looking too happy.

SECOND COMMITTEE MEETING.

Overseers were in accord that since the strength of poison had been increased more definite results were obtained. It was felt that another week would make a big difference. Time bore this out, and at the end of the third week the whole of the area was practically cleaned up, and with the addition of one or two extra days for some of the overseers, the settlement was pronounced clean by the end of the first week in February.

OBSERVATIONS ON THE PEST.

Contrary to general belief, there is no indication as to the egg beds before hatching unless the grasshoppers were noticed laying the eggs. Later experience showed us the most suitable places to look. The young hoppers remained in the vicinity of the hatching ground for approximately three days; this was the time to poison them. Hoppers kept emerging from the same bed for 14 days. This is the strongest argument against spraying with kerosene emulsion, because the spray only killed those which came into actual contact with the mixture.

AVERAGE EGGS IN EACH HOLE.

This varied from 40 to 80. Number of holes per square foot; the highest count was in the vicinity of 1,400; counts of 500 to 600 were common.

EFFECT OF WATER.

At first it was thought that the eggs could be rendered infertile by submerging them in water; this proved a mistake. The lining surrounding the eggs is impervious to water; such watering only increased the humidity and hastened hatching. There appeared to be a definite relationship between watered land and the egg beds, *i.e.*, land that had dried to the right degree of dampness was selected for the laying of the eggs. Couch grass patches were the most favoured spots, lucerne patches and channel and headland ditches being next in popularity. The lighter soils appeared to hatch out earlier.

EXPERIMENTS CARRIED OUT.

1. Two or three day old hoppers were placed in a bottle with the poison bait; 100 per cent. kill was obtained in 12 hours.

2. A considerable quantity of young hoppers was kept in a bottle without food. The majority were dead in three to four days, 100 per cent. in five days. This bore out the statement that no danger was to be feared from the depastured areas surrounding the settlement, as the hoppers would remain near the hatching beds for three days and starve for want of green nourishment.

REASONS FOR STRENGTHENING THE ARSENITE OF SODA IN BAIT.

The arsenite of soda used at Mildura and which was used to compute the figures issued to all growers was at 80 per cent. strength; the arsenite supplied to this district was at 62½ per cent., consequently the alteration.

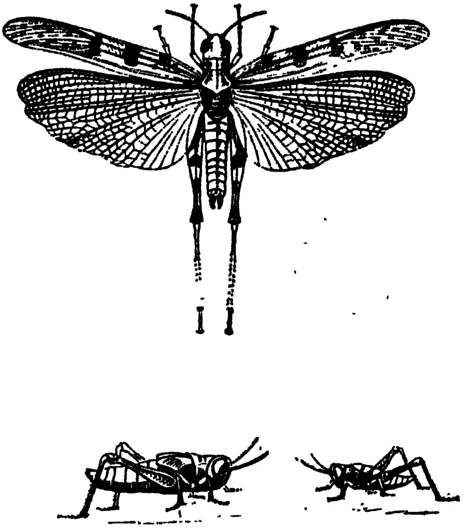
ENEMIES OF GRASSHOPPERS.

Birds, fowls, &c., accounted for a limited number of young hoppers. The chief enemy, however, was a very small black wasp which laid its egg in the egg of the grasshopper. This, of course, rendered the egg infertile.

OBSERVATIONS ON DIFFERENT METHODS OF COMBATING THE PESTS.

Cultivating the soil is useless unless done when the eggs are very young. Cultivating at a later period does not kill the eggs. They hatch out when they have been exposed to the sun for a short period.

Spraying is effective for small, thick colonies, but too expensive and slow for big areas, and it has the drawback of only killing by contact. Where eggs are hatching for a period of 14 days from the one breeding ground it is a waste of time.



[From *N.S.W. Agricultural Gazette.*]

Larger Plain Locust (*Chortoicetes terminifera*).

Top—Adult.

Bottom Right—Youngest stage of "hopper."

Bottom Left—Late stage of "hopper," with wing pads well developed.

Poison bait is the only way to treat any large area, or for that matter any area. It proved absolutely effective, is easy to mix, and easily and quickly spread.

Burning is of assistance where the hoppers are very thick, but it must be followed up by poisoning.

APATHY OF GROWERS.

At first, a little apathy was encountered amongst the old settlers. It can be taken as a rule—the dirtier the block the greater the apathy. The best way to counter this was to take them for a car ride to the worst infested spots in the area. It was quite a good study in human nature to watch the grin leave their faces. These men, after this treatment, became some of our best helpers.

If immediate steps had not been taken when the pest first appeared, considerable damage must have been the result, and it was only by the loyal and hard work of the overseers that this was avoided. To them is due the greatest thanks; no hours were too long, and their first and last thoughts while they were on the job were—grasshoppers.

THE GRASSHOPPER MENACE.

The following is a copy of the circular sent to all farmers in the Renmark district by the Renmark Irrigation Trust:—

The plague of grasshoppers throughout this district, in common with most parts of the State, appears to be reaching a menacing stage, demanding immediate and combined action. The seriousness of the position lies in the wholesale breeding that is said to be in progress at present, which, if unchecked, is calculated to present a serious problem in the course of a week or two. Already young hoppers are to be found—the first fruits of what it is feared may be a heavy hatching. So momentous has the position become in parts of the State that the Government enacted special legislation to combat the plague. The new law requires all landholders to examine closely their properties for egg beds, to report the existence of breeding grounds to the district council for their district, in this case, the Trust, and to take all possible measures to ensure the destruction either of the eggs or the newly hatched hoppers. The breeding beds are usually small in area—a few square yards—and the eggs are deposited up to 3in. into the soil. The holes are usually capped with a silvery mucus somewhat similar to the hole of a trap-door spider, and may contain up to 60 or 80 eggs apiece. Following an investigation by a specially appointed committee, headed by Professor Perkins, the Government has issued a pamphlet setting out the measures to be taken. A copy is attached for your information and guidance.

The following is taken from a further circular issued by the Government to councils on the 10th instant:—

Comparatively little can be done against the flying swarms that are at present to be met with in various parts of the State. It is important, however, that some notice should be taken of the areas of ground over which these grasshoppers are depositing eggs, which will hatch out as soon as the combination of moisture and temperature is favourable, *i.e.*, that may hatch out during January or as late as early autumn, say, March and April. Landowners should be instructed to mark areas known to carry eggs so that they may be watched until hatching is apparent. In the meantime, if the ground is in such a condition that it could be stirred up with heavy cultivators, the councils should give instructions that this work should be carried out by landholders. Two or three workings given at 10-day intervals should prove effective. It is reported from Palestine that treatment of this kind, if well carried out, may lead to the destruction of 90 per cent. of the eggs, and thus save the landowners considerable trouble and expense in attempting to tackle the hoppers at a later stage. Should the hoppers hatch out early, say, in January, it is quite possible that they may die because of the absence of suitable green feed, but as a precautionary measure it is necessary that poison baits, as described in the leaflet forwarded to the councils, should be scattered carefully among the young hoppers. At this stage the areas could also be sprayed with kerosene emulsion quite satisfactorily. Fire might be used to destroy the hoppers, so long as the regulations are observed against fire outbreaks.

Under the new Noxious Insects Act *it is compulsory* for all landholders to search for breeding grounds, to mark and report any found to the Trust, and to follow up with destructive measures as outlined. Penalty, £20.

In such a matter as this, however, where the property and crop of each and every grower is equally endangered, we feel sure there is no occasion to emphasise the necessity for prompt and concerted action.

IF YOU THINK CREAM SEPARATOR DISCS HAVE A SOFT JOB — JUST REMEMBER THESE FACTS:

A cream separator bowl spins at speeds ranging from 8,000 to 10,000 revolutions a minute. In the heart of the bowl scientifically designed discs direct the course of the whirling, swirling mass of milk, leading the cream to one outlet and the skimmed milk to others. The centrifugal force generated exerts an unbelievably heavy pressure on these discs.

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DEVELOPMENT OF OUR HILLS COUNTRY.

[*A Wireless Talk through 5CL by* MR. R. HILL, *District Agricultural Instructor.*]

During the last decade I have been in close touch with, and have endeavoured to assist in, the development of much of the land in counties Adelaide, Sturt, and Hindmarsh. These counties include that stretch of country extending from Mount Pleasant to Cape Jervis, which enjoys a good rainfall, has reasonably good transport conditions, social facilities, and is in close proximity to our markets.

The western portion of county Adelaide from Gawler to Willunga, and the eastern portion of county Sturt extending out to the River Murray, are occupied by farmers interested principally in cereal growing and sheep raising, and are not included in the area under discussion.

However, some statistical figures dealing with the livestock population of these three counties for the last decade should be of interest and some guide in ascertaining the future prospects of the better rainfall portions when the country is further developed, particularly from "the grass land" point of view. Briefly, the livestock population has shown the following changes during the last 10 years:—

Cattle—From 61,375 to 80,926, an increase of 19,551 head.
Horses—From 33,164 to 22,287, a decrease of 10,877 head.
Lambs—From 159,837 to 207,759, an increase of 47,922 head.
Sheep—From 406,299 to 589,844, an increase of 183,545.
Wool (excluding Lambs)—From 3,695,892lbs. to 5,916,163lbs., an increase of 2,220,271lbs., or per sheep from 9lbs. to 10lbs.
Pigs—From 20,613 to 23,248, an increase of only 2,635 head.

These figures are for the whole of the three counties. Taking County Hindmarsh alone, where practically all the conditions are more applicable to the area under discussion, the figures during the above period were—

Cattle—From 16,602 to 21,142, an increase of 4,542 head.
Horses—From 5,815 to 4,173, a decrease of 1,642 head.
Lambs—From 49,909 to 62,321, an increase of 12,412.
Sheep—From 143,746 to 196,921, an increase of 53,175 head, and an increase per sheep of approximately 1lb., now averaging a little under 10lbs.
Pigs—From 5,568 to 6,385, an increase of 817 head.

At a glance perhaps these figures do not indicate very much, but it must be remembered that they show steady progress during a period, for the last few years of which finance for developmental work of this kind has not been easily obtained.

The main factors responsible for the increases were superphosphate and Subterranean Clover, coupled with the subdivision of pastures into smaller fields. The matter of pasture management is important, and, unless good types of grasses, such as Perennial Rye Grass, Wimmera Rye Grass, and *Phalaris tuberosa* are introduced, the inferior annual grasses and weeds will take control as the growth of clover decreases.

Small fields are necessary in order to force even grazing by livestock, which has been proved to be very essential, particularly where sheep are on wet luscious pastures.

Rotational grazing, which allows quick changes on to fresh and sweet pastures, will provide the ideal in pasture management, and the application of the practice will help materially in the improved carrying capacity.

Although there is a large area of scrub yet to be cleared and converted into pastures, closer attention to pasture management on the land already cleared should not be neglected. The use of meadow hay and silage has been important in helping stockowners to carry more livestock and carry them better.

The area of pastures top-dressed with superphosphate in the three counties has increased from 28,407 acres to 82,065 acres, showing an increase of 53,658 acres. Meadow hay has shown an increase of 3,606 tons from 3,831 to 7,437 tons, and silage an increase of 1,071 tons from 2,409 tons to 3,480 tons.

A study of these figures shows steady development along sound lines in country which is right at our front door with a potential value which unfortunately has been too long despised.

Large areas of this country still remain in their virgin state awaiting development, and isolated cases of splendid pastures surrounded by scrub can be seen throughout the whole area.

One does not have to travel far to find numerous cases where individuals have in 10 years converted scrub land into pastures carrying, with good management, anything up to four sheep per acre, and there are tens of thousands of acres of scrub land still untouched and capable of being treated economically in the same manner.

On the other hand, large areas of partially developed land can be improved to the standard of that worked by the more progressive type of grass-land farmer.

Apart from the pasture work possible on virgin lands, the carrying capacity of the country can be increased considerably by the growing of cultivated crops, which will return high yields once the soil fertility has been improved, through the medium of well-grown pastures.

At the present time a large area of land is growing potatoes profitably, whereas less than 10 years ago it was considered of no practical value, and fortunately South Australia is able to produce its own requirements.

Several years ago in a talk similar to this I made reference to the possibilities of development in this country, and I feel more convinced to-day that experience gained in the past should give us confidence to undertake the development of such a valuable asset right at our front door.

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SPRAYS AND SPRAYING.

[*Address Broadcast from 5CL, 3rd September, 1935, by* MR. R. FOWLER, *Manager, Government Experiment Orchard, Blackwood.*]

Spraying is an operation vitally necessary for the production of payable crops of fruit and the more time, money and labour spent on pruning, cultivating, and manuring, the more necessary it is to insure the crop by spraying, because, after all, spraying must be looked upon as an insurance premium paid when the work is well done. It is generally too late to apply a spray when the damage caused by the insect or disease is apparent, as the object of spraying is rather to prevent injury, than to cure it.

In order to select sprays, and apply them intelligently, the fruit-grower should know something about not only the spray material he is going to use, but also something of the life history of the insect or fungus disease he wishes to combat, and the manner in which the spray might be expected to act upon it. Growers have now many opportunities of learning, as much literature is published by the various Departments of Agriculture, and these are available at little or no cost.

Broadly speaking, orchard trees and fruits are menaced by two classes of diseases—insect and fungus—and these in turn are, from the viewpoint of control by spraying, again divided into two types. In the first place, with insects, there are those which chew their food with their mandibles or jaws, such as beetles and the larvae of moths like the Codlin Moth; and secondly, those which possess long slender mouthpieces, which enable them to suck the juices from the plant by penetrating the foliage, bark and fruit, such as aphides, scales, and red spiders, etc.

The first named, the chewing insects, are best controlled by coating their food with a stomach poison, like arsenate of lead. The second class, which get their food by suction, are held in check with contact sprays, those commonly in use being Black Leaf 40, kerosene emulsion, red and white oil.

This second class of insects is, as a rule, sluggish, remaining stationary unless violently removed. They cluster thickly on stem, leaves, and fruit, and can be directly reached with a spray which will kill them by suffocation or internal irritation. This action of the spray will be better understood when it is pointed out that the respiratory system of insects is of the simplest description. They breathe, not through the mouth, but by means of tiny pores in the body, called spiracles, and if these pores are clogged with an oil spray, or irritated by strong fumes, death quickly follows. Nature provides these insects with some form of natural protection, sometimes in the form of a downy covering, like wool, a sticky resinous substance, or a waxy scale, and any spray directed against them needs to be driven with sufficient force to dissolve the outer covering to get at the insect beneath. Moreover, some contact sprays act as an ovicide, as in addition to killing the insects, they also destroy the eggs. Tar distillate washes have proved particularly useful in this way for the control of green aphis. Codlin Moth eggs are also destroyed when white oils are added to the arsenical sprays.

Then there are the fungus diseases, also divided into two types, and the methods of dealing with them vary with the different habits of each type. One class of fungi known as external or ephiphytic grow on the outside of the tree or plant, and absorb their food by means of suckers. Oidium of the vine is a typical illustration, and this class being always open to treatment is generally effectively controlled with flowers of sulphur or lime sulphur used during warm weather. The other class is known as the internal or endophytic fungus, the mycelium of which grows inside the plant, and cannot be reached by spraying. Most of the serious fungus diseases of the orchard belong to this class, represented by Black Spot of the apple and pear, Curl Leaf of the Peach, Shothole of the apricot, almond, and plum, and anthracnose and downy mildew of the vine. These diseases generally become active in early spring, and must be attacked before they have a chance to become embedded in the living tissue. A Bordeaux or lime-sulphur spray applied when the flower buds are showing pink will generally be found a good protection in the case of all but the latter two diseases. In some localities more than one spray will be necessary, particularly in the case of Black Spot of the apple and pear.

SPRAYS.

Sprays are classed as insecticides or fungicides, according to the particular grouping under which they are used, some acting in both capacities. Insecticides are divided into (*a*) stomach poisons and (*b*) contact insecticides. The most commonly known stomach poison is arsenate of lead, and this is now almost universally used against all leaf-eating insects. It has proved the most effective remedy for codlin moth, but owing to the health regulations of various countries, which prohibit the importation of apples and pears carrying more than a certain amount of arsenical residue, efforts are now being made to find a non-arsenical substitute. Arsenate of lead is used against codlin moth at the rate of 3lbs. or 4lbs. powder or 6lbs. paste to 100 gallons of water. There is a popular belief that a stronger solution will give better results, and some growers use up to 8lbs. of paste, or more, to the 100 gallons, but whether it is economic to use the heavier concentration is very doubtful. Experiments conducted in other countries and at the Experiment Orchard, Blackwood, seem to indicate that stronger solutions do not give better results. Arsenate of lead contains very little soluble arsenic, which is injurious to fruit and foliage, and therefore it can be used in fairly strong concentrations. It stays in suspension well, and is not easily washed off by rain. It is most effective when applied against the young insects, caterpillars, and grubs, since the older the insects, particularly beetles, like Curculio, the harder they are to poison. It has also been demonstrated in New Zealand that the finer the particles the more effective the spray, and efforts are now being made to produce a colloidal arsenate of lead.

CONTACT INSECTICIDES.

These are effective against both groups of insects since they kill by contact, but they are used mostly against soft-bodied insects or sap-feeders. They are either corrosive, acting directly on the insect body, or fumigants acting through the breathing system. Those most in use in South Australia are nicotine suphate or Black Leaf 40, and miscible oils, both red and white.

Black Leaf 40, or nicotine sulphate, is one of the most efficient contact insecticides known, and quickly destroys aphides and young scales. Though fairly expensive, it is an economical spray to use, as it gives certain results. It is used as a strength of 1 part to 800 parts, and though sometimes applied alone, it seems to give better results when used in combination with soft soap: 3lbs. to the 100 gallons, or white oil, ¾ gallon per 100 gallons. It can be used at any time of the year. It also mixes without injury with other sprays, and can be used in combination with lime-sulphur, arsenate of lead, oil, or Bordeaux mixture. Red oil is also used as a winter spray, 1-20-25, for the control of aphides, scale, and red spider, and white oil in the summer, when red oil would cause injury to the foliage. Rainwater should be used to make the primary emulsions, and the directions of the manufacturers should be carefully followed. Severe agitation is not desirable when spraying with oil sprays, as there is a danger of breaking up the emulsion and clogging the pump.

FUNGICIDES.

Those in common use amongst commercial fruitgrowers are Bordeaux mixture, Burgundy mixture, and lime-sulphur. These sprays are applied, as previously stated, with the object of providing a protective coating to the developing leaves, and killing any fungus spores present on the plant.

Bordeaux mixture was discovered in 1882 by accident in a vineyard in France, and has since become the most efficient fungicide known, and the most widely used. Unfortunately, it is not safe to use this spray on apples after leaves and fruit are formed, as it is apt to cause severe russetting, but it may be used on pears, provided a suitable strength solution is applied. For use in the winter, the generally recommended formula is 6 : 4 : 50 (6lbs. bluestone, 4lbs. fresh lime, and 50 gallons water); summer strength 3 : 4 : 50. There are many variations of these formulae, but they can be taken as a guide, and if desired, experiments can be carried out by the individual grower to determine the best mixture for his particular set of conditions, the object being to get the maximum control of the fungus with the minimum damage to the leaves and fruit. Methods of mixing are probably well known to all fruit-growers, but care should be exercised in this respect. It is generally recommended that too strong solutions should not be mixed together, but that one should be diluted in the full quantity of water, and then the other stock solution added, and it is thought better to dilute the lime solution, and then add the bluestone solution, than *vice versa*.

Burgundy mixture is sometimes used instead of Bordeaux, as good, fresh quicklime is not always available, and it is easy to keep on hand a supply of washing soda. The usual formula for Burgundy mixture is 4 : 6 · 50, but this may be varied, as in the case of Bordeaux. The relative efficiency of Bordeaux or Burgundy mixtures is still a matter of dispute. Burgundy mixture has been used almost exclusively for many years at the Experimental Orchard with satisfactory results. It appears to be more adhesive than Bordeaux, and less likely to choke the nozzles; but used in combination with arsenate of lead as a combined spray, it is likely to cause injury to the foliage. The fungicidal action of both these sprays is due to the slow liberation of soluble copper under the influence of atmospheric moisture. Lime sulphur sprays have been in use for many years, and are becoming more generally popular, particularly for the control of black spot of the apple and pear, owing to the fact that copper sprays are liable to cause russetting, if applied in the calyx stage, or later. An additional value in the lime sulphur is the fact that it also acts as an insecticide to some extent, and will control red spider. Investigations in New Zealand have shown that the fungicidal action of lime sulphur is due to the calcium polysulphide compound contained in spray. Lime sulphur may be used in the dormant season at the rate of one gallon to 10 or 15 of water; when the buds are unfolding, one gallon in 30 to 35; and when trees are in leaf, one gallon to 100 to 120. Good commercial brands of lime sulphur are fairly uniform in composition, the degrees Baume being guaranteed, but strictly speaking lime sulphur sprays should be tested with a hydrometer, to ensure reliability and avoid injury.

SPREADERS.

During recent years, many substances have been put on the market, designed to improve the adhesive properties of sprays, and to distribute more evenly the film of spray. For this purpose, soaps, oils, milk, &c., have been tried, but the only one which has come into general use is calcium caseinate, a manufactured by-product from the dairying industry. Whether the spreader is beneficial to the extent that is sometimes claimed is a matter for doubt. One pound of spreader is usually added to 100galls. of spray, but experiments in America go to show that ½lb. per 100galls. will give better results.

Spraying costs are a very important item in fruit production, and a careful study is necessary, of the relative prices of each spray material, so that the grower may choose those sprays which are most efficient, yet keep his costs within economic limits.

In operation, it is important to see that the spraying is thoroughly done, even if there appears to be an apparent waste of liquid. The results will depend on whether the spray is applied to all parts of the tree where needed. Consideration must be given to the particular disease that is being treated. If it is a fungus disease, a general coating of leaves and fruit should be aimed at, if codlin, the calyx and fruit should receive particular attention.

Spraying is usually a disagreeable job, but nevertheless, it is a very important one.

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PURE-BRED COWS COMPLETED OFFICIAL TEST

JUNIOR TWO-YEAR-OLDS—

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
44811	Lanacoona Brown May	C. E. Verco, Mount Compass	Jersey	24/6/34
46533	Tuela Strelitzia	F. Coleman, Saddleworth	"	8/7/34
44807	Lallawa Chieftain's Diana 2nd	Mrs. A. Bowman, Meningie	"	16/6/34
Not allotted	Glen Ewin Columbine's Fancy 3rd.	Jas. McEwin, Houghton	"	24/4/34
46525	Tuela Geranium	C. E. Verco, Mount Compass	"	26/9/34
45955	Rivington Peggy	J. W. Crompton, Victor Harbour	"	8/7/34
44813	Lanacoona Wildflower	C. E. Verco, Mount Compass	"	10/8/34
46212	Stonyfell Briar	J. W. Crompton, Victor Harbour	"	15/6/34
Not allotted	Glen Ewin Coutance's Queen	R. J. Laing, Gumeracha	"	7/7/34
"	Tuela Snowgem	F. Coleman, Saddleworth	"	11/8/34
40150	Hampden Blonde's Jeanette	J. A. J. Pfitzner, Hampden	"	30/3/34
44260	Hampden Blonde's Crisette	J. A. J. Pfitzner, Hampden	"	21/8/34
Not allotted	Kiama Mayflower 9th	E. and A. Nicholls, Woodville	A.I.S.	11/9/34
"	Tuela Moss Rose	F. Coleman, Saddleworth	Jersey	7/7/34
"	Glen Belah Heather	E. O. Hancock, Andrews	Ayrshire	4/5/34
45182	Mira Chana Capture	H. B. Peters, Mount Compass	Jersey	14/6/34
Not allotted	Gambier Princess Olive	A. P. Spehr, Mount Gambier	"	2/9/34
46523	Tuela Dierama	F. Coleman, Saddleworth	"	26/6/34
Not allotted	Lallawa Twylish Carnation 2nd	Mrs. A. Bowman, Meningie	"	27/7/34
"	Kiama Honeycomb 2nd	E. and A. Nicholls, Woodville	A.I.S.	17/8/34
"	Oakhill Queen	L. W. Frost, Saddleworth	Jersey	9/9/34
7505	Tabbagong Beauty 22nd	J. M. Irwin, Mount Barker	A.I.S.	3/7/34
45642	Para Wirra Queen	J. H. Dawkins, Gawler	Jersey	29/5/34
46037	Roseworthy Princess 52nd	Agricultural College, Roseworthy	"	10/6/34
42748	Alexandra Mayflower	A. Kelly, Milang	"	4/7/34
Not allotted	Cudlee Creek Lady Jane 2nd	Mrs. W. A. Pool, Cudlee Creek	"	26/9/34
39508	Delma Noble Lotus	E. W. Pfitzner, Eudunda	"	13/5/34
Not allotted	Ontario Princess Millie	T. B. Brooks, Clarendon	"	27/8/34
40138	Gunawah Gold Thread	E. W. Pfitzner, Eudunda	"	6/7/34
Not allotted	Tuela Festuca	F. Coleman, Saddleworth	"	9/7/34
"	Para Vale Millie 3rd	A. J. Marrett, Saddleworth	"	23/9/34
"	Glen Belah Shirley	E. O. Hancock, Andrews	Ayrshire	5/8/34
42749	Alexander Royal Belle	A Kelly, Milang	Jersey	8/7/34
Not allotted	Palpara Flora	Mrs. C. E. Mayger, Kapunda	"	28/7/34
43580	Cumberland Countess	L. W. Frost, Saddleworth	"	12/6/34
41237	Navua Grose Lassie	R. J. Laing, Gumeracha	"	10/4/34
46032	Roseworthy Glimmer's Maid	Agricultural College, Roseworthy	"	7/6/34
45445	Ninyeri Dainty Miss	E. L. Goode, Narrung	"	2/7/34
Not allotted	Gambier Lady Beena	A. P. Spehr, Mount Gambier	"	5/7/34
44205	Greenoaks Cunning Lass	W. A. Mueller, Ambleside	"	9/5/34
Not allotted	Raglan Peggy	D. Fitzgerald, Edwardstown	"	24/9/34
41236	Navua Fascination	O. H. Woodward, Gilles Plains	"	20/5/34
Not allotted	Kiama Robin 5th	E. and A. Nicholls, Woodville	A.I.S.	19/7/34
39499	Delma Aristocratic Lady	E. W. Pfitzner, Eudunda	Jersey	9/4/34
Not allotted	Ontario Audrey	T. B. Brooks, Clarendon	"	2/8/34
45448	Ninyeri Queen	E. L. Goode, Narrung	"	23/7/34
45442	Ninyeri Beatrice	E. L. Goode, Narrung	"	10/9/34
Not allotted	Cudlee Creek Pretty Maid	Mrs. W. A. Pool, Cudlee Creek	"	21/8/34
"	Para Wirra Beauty's Daisy	J. H Dawkins, Gawler	"	19/9/34
"	Dunleith Millie 2nd	Dunleith Pastoral Co., Ashbourne	A.I.S.	27/8/34
"	Spring Park Pretty Maid	W. Nitschke & Son, Littlehampton	"	27/8/34
"	Morella Princess 2nd	H. R. Walsh, Mount Barker	Jersey	22/8/34
8279	Kiama Beauty	Calf Club, Sutton Town	A.I.S.	12/4/34
Not allotted	Park View Honeysuckle 13th	J. M. Irwin, Mount Barker	"	11/8/34
"	Channel View Dolly Grey	Mrs. A. M. Carruthers, Narrung	Jersey	13/8/34
"	West Kilbride Lilette	Insp.-General Hospitals, Northfield	Ayrshire	14/8/34
"	Pembroke Vanilla	Mrs. C. W. Ansell, Bolivar	Jersey	20/8/34
"	Kyby Snowlady	Govt. Farm, Kybybolite	Ayrshire	7/7/34
"	Kiama Pansy	Calf Club, Sutton Town	A.I.S.	17/4/34
"	Kiama Daphne	Calf Club, Sutton Town	"	13/6/34
24970	Glencourt Dinah 4th	Insp.-General Hospitals, Northfield	Ayrshire	5/4/34
Not allotted	Kyby Winnifred	Govt. Farm, Kybybolite	"	27/7/34

BETWEEN JANUARY 1st, AND JUNE 30th, 1935.

Age at Calving.	Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.	%	Lbs.			
Butterfat Standard, 230lbs.						
1 9 7	7,901	5·44	430·08	273	Werribee Combination	—
2 0 2	6,759	5·94	401·49	273	Tuela Syra	—
2 0 20	6,759½	5·17	395·66	273	Chieftain 2nd of Dalebank	—
1 9 13	6,819½	5·77	393·57	273	Werribee Masterman	—
2 2 19	6,792½	5·79	393·28	273	Tuela Syra	—
1 9 18	6,576	5·62	369·27	273	Baxter of Banyule	—
1 11 23	6,736½	5·29	356·92	273	Werribee Combination	—
2 0 25	6,360½	5·39	342·99	273	Baxter of Banyule	—
1 10 7	6,900½	4·96	342·62	273	Werribee Masterman	—
2 0 15	5,731	5·88	336·99	273	Tuela Syra	—
2 0 2	5,601	5·95	335·45	273	Bellefaire Blonde's Aristocrat	—
1 7 20	5,983½	5·51	329·86	273	Bellefaire Blonde's Aristocrat	—
2 1 18	8,277½	3·95	326·92	273	Kiama Pembroke	—
1 9 27	5,660½	5·65	319·77	273	Tuela Syra	—
1 8 18	7,078½	4·52	319·90	273	Kyby Robin	—
1 10 8	6,297	5·04	317·34	273	Dalebank Noble Lord 6th	—
1 11 14	6,050	5·17	312·78	273	Hampden Olive's King	—
1 11 20	5,436	5·70	309·93	273	Hampden Winsome King	—
2 2 9	5,419½	5·54	300·31	273	Chieftain 2nd of Dalebank	—
1 10 14	8,250	3·62	298·98	273	Pembroke of Greyleigh	—
1 6 23	6,181	4·77	295·01	273	Delma Butter King	—
2 4 2	7,098	4·15	294·53	273	Park View Reward 2nd	—
1 10 26	5,589½	5·31	294·21	273	Para Wirra Millie's Pylon	—
2 2 24	4,600½	6·37	292·85	273	Roseworthy Pretty Duke	—
2 1 7	4,912½	5·96	292·71	273	Hampden Queen's Repeater	—
1 8 8	5,950½	4·88	290·63	273	Dalebank Producer 3rd	—
1 9 23	5,254	5·45	286·29	273	Dalebank Noble Duke	—
1 11 22	5,767½	4·96	286·07	273	Dalebank Viola's Duke	—
2 0 12	5,073½	5·62	285·36	273	His Grace (Imp.)	—
2 0 2	4,934	5·77	284·61	273	Tuela Syra	—
2 4 1	5,865½	4·85	284·31	273	Para Vale Lord Mac	—
1 5 13	6,192	4·58	283·48	273	Kyby Robin	—
2 0 28	5,448½	5·08	276·73	273	Bellefair Blonde's Signal	—
1 11 27	5,317½	5·20	276·72	273	Wooroora King's Hero	—
1 8 4	5,157½	5·34	275·22	273	Silver Lad of Eudunda	—
1 11 21	4,496½	6·06	272·71	273	Navua Grose Lad	—
1 10 18	4,266	6·29	268·36	273	Roseworthy Pretty Duke	—
2 2 13	5,308½	4·98	264·41	273	Hampden Mayflower King	—
	5,707½	5·07	289·20	300		
1 9 26	4,860½	5·34	259·66	273	Hampden Olive's King	—
1 6 21	4,560½	5·66	258·34	273	Navua Cunning Lad	—
1 6 0	5,113	4·99	255·27	273	Glen Echo Kelly's Lad	—
2 1 23	4,414½	5·76	254·46	273	Wistaria Laddie	—
1 11 18	6,735	3·76	252·97	273	Pembroke of Kiama	—
1 9 6	4,561	5·52	251·78	273	Bellefaire Blonde's Aristocrat	—
2 4 22	5,316½	4·72	251·09	273	Ontario Millie's Twylish	—
2 4 9	5,049	4·97	251·07	273	Hampden Mayflower King	—
1 7 13	4,697	5·26	246·90	273	Hampden Mayflower King	—
1 8 5	4,559	5·40	246·38	273	Cudlee Creek Masterman	—
1 9 7	4,291½	5·64	241·96	273	Para Wirra Jack	—
2 1 8	6,712½	3·60	241·43	273	East View Sultan	—
	7,207½	3·64	262·19	300		
1 9 18	6,208½	3·88	241·05	273	Kiama Jack	—
2 1 5	3,735½	6·45	240·98	273	Anemone's Chief 5th of Morella	—
2 5 15	6,889½	3·49	240·41	273	Viscount of East View	—
2 3 14	6,269½	3·81	238·70	273	Park View Don	—
2 0 26	4,740½	5·03	238·28	273	Channel View Prince	—
2 2 22	5,284½	4·49	237·36	273	Oakbank Classical	—
2 0 2	4,240	5·57	235·97	273	Twylish of Para Wirra	—
2 1 17	5,391	4·37	235·77	273	Gowrie Park Scottish Dandy	—
2 1 25	6,526½	3·60	235·06	273	Pembroke of Greyleigh	—
2 2 16	5,337	4·38	233·58	273	Liberton Freedom	—
1 10 21	5,613	4·15	232·84	273	Belle's Best of Glencourt	—
2 1 18	5,564	4·18	232·71	273	Gowrie Park Scottish Dandy	—

PURE-BRED COWS COMPLETED

JUNIOR TWO-YEAR-OLDS—

Herd Book No.	Name of Cow.	Owner and Address.	Vreed.	Calved.
46031	Roseworthy Fay 2nd	Agricultural College, Roseworthy	Jersey	10/6/34
Not allotted	Pembroke Lena Lotus	Mrs. C. W. Ansell, Bolivar	"	18/10/34
"	Dunleith Millie 3rd	Dunleith Pastoral Co., Ashbourne	A.I.S.	1/9/34
8492	Northfield Prince's Charm	Insp.-General Hospitals, Northfield	"	22/4/34
46036	Roseworthy Princess 51st	Agricultural College, Roseworthy	Jersey	1/7/34
46038	Roseworthy Schoolmistress	Agricultural College, Roseworthy	"	26/6/34
Not allotted	Pembroke Merle	Mrs. C. W. Ansell, Bolivar	"	18/8/34
"	Tabbagong Belle 9th	J. M. Irwin, Mount Barker	A.I.S.	16/7/34
"	West Kilbride Fairy	Insp.-General Hospitals, Northfield	Ayrshire	18/7/34
43584	Cumberland Princess Rhonda	L. W. Frost, Saddleworth	Jersey	14/9/34
Not allotted	Northfield Sunflower 3rd	Insp.-General Hospitals, Northfield	A.I.S.	3/9/34
46124	Scrub View Duchess	A. B. A. Weckert, Brinkworth	Jersey	14/8/34
8490	Northfield Melba's Janet	Insp.-General Hospitals, Northfield	A.I.S.	30/7/34
Not allotted	West Kilbride Felicity	Insp.-General Hospitals, Northfield	Ayrshire	18/7/34
45447	Ninyeri Princess	E. L. Goode, Narrung	Jersey	17/8/34
Not allotted	Channel View Nellie Grey	Mrs. A. M. Carruthers, Narrung	"	10/8/34
39501	Delma Blonde's Signpost	E. W. Pfitzner, Eudunda	"	27/4/34
Not allotted	Dunleith Gladsome	Dunleith Pastoral Co., Ashbourne	A.I.S.	9/9/34
"	Cudlee Creek Silk Sox	Mrs. W. A. Pool, Cudlee Creek	Jersey	8/8/34
"	Glen Ewin Roseleaf	Jas. McEwin, Houghton	"	22/11/34
"	Hampden Olive's Blondinette	J. A. J. Pfitzner, Hampden	"	23/8/34
"	Pembroke Fancy Lotus	Mrs. C. W. Ansell, Bolivar	"	17/8/34
"	West Kilbride Lassie	Insp.-General Hospitals, Northfield	Ayrshire	8/6/34
"	Pembroke Floss	Mrs. C. W. Ansell, Bolivar	Jersey	7/10/34
"	Albion Fifi	E. T. Vinall, Brighton	Guernsey	30/7/34
"	Kyby Ida	Government Farm, Kybybolite	Ayrshire	5/7/34
43585	Cumberland Sundew	L. W. Frost, Saddleworth	Jersey	17/8/34
43582	Cumberland Lily	L. W. Frost. Saddleworth	"	10/9/34
Not allotted	Para Wirra Magiona's Daphne	J. H. Dawkins, Gawler	"	13/11/34
"	Gowrie Park Posey	Insp.-General Hospitals, Northfield	Ayrshire	3/4/34
"	Northfield Janet's Princess	Insp.-General Hospitals, Northfield	A.I.S.	25/4/34
"	Dunleith Cheerful	Dunleith Pastoral Co., Ashbourne	"	9/9/34
"	Kyby Reveal	Government Farm Kybybolite	Ayrshire	18/7/34
"	Inman Countess	G. V. Rogers, Inman Valley	Jersey	16/11/34
46033	Roseworthy Lady 5th	Agricultural College, Roseworthy	"	13/6/34
45682	Pembroke Della	Mrs. C. W. Ansell, Bletchley	"	5/5/34
Not allotted	Gambier Peggy's Starry	A. P. Spehr, Mt Gambier	"	1/10/34
Not allotted	Gambier Dinah's Dream	A. P. Spehr, Mt. Gambier	"	12/10/34
Not allotted	Pembroke Fairy Duchess	Mrs. C. W. Ansell, Bolivar	"	3/10/34
45184	Mira Chana Lucy	H. B. Peters, Mt. Compass	"	7/11/34
Not allotted	Glenlea Fairy	E. T. Vinall, Brighton	Guernsey	3/5/34
Not allotted	Gambier Una 2nd	A. P. Spehr, Mt. Gambier	Jersey	20/10/34
Not allotted	Anama Transvaal Twilight	W. Hawker, Clare	Friesian	6/9/34
Not allotted	Beetaloo Mystic Grey	Mrs. E. M. Johns, Daly Street, Sth. Plympton	Jersey	21/1/35
Not allotted	Sweet Haven Enchantress 2nd	J. M. Bray, Langhornes Creek	"	25/2/35

SENIOR TWO-YEAR-OLDS—

Herd Book No.	Name of Cow.	Owner and Address.	Vreed.	Calved.
41545	Pella Viola Doone	C. E. Verco, Mt. Compass	Jersey	13/9/34
Not allotted	Glen Ewin Misty Morn	R. J. Laing, Gumeracha	"	26/5/34
45638	Palpara Silver	Mrs. C. E. Mayger, Kapunda	"	26/9/34
40624	Lakeland Silvette	R. J. Laing, Gumeracha	"	7/9/34
45183	Mira Chana Gem	H. P. Peters, Mt. Compass	"	5/9/34
42025	Stoneyfell Heather	J. W. Crompton, Victor Harbour	"	16/6/34
38621	Woodside Wonderful Maid	J. A. J. Pfitzner, Hampden	"	25/4/34
41442	Overlook Remus Spark	E. W. Pfitzner, Eudunda	"	27/8/34
46825	Xavier Valda 2nd	A. P. Spehr, Mt. Gambier	"	5/6/34
41443	Overlook Remus Sunny	J. A. J. Pfitzner, Hampden	"	27/8/34
42635	Wooroora Twinkles	A. Kelly, Milang	"	17/4/34
39478	Cudlee Creek Viola	Mrs. W. A. Pool, Cudlee Creek	"	6/4/34
41438	Overlook Remus Oxulla	E. W. Pfitzner, Eudunda	"	28/8/34
39504	Delma Spotlight	E. W. Pfitzner, Eudunda	"	25/9/34
34690	Wooroora Waffles	A. B. Sieber, Eudunda	"	11/4/34
41117	Morella Princess	H. R. Walsh, Mt. Barker	"	8/8/34
46531	Tuela Rose	F. Coleman, Saddleworth	"	11/8/34
39492	Dalkey Bonnie Lass	G. D. Oster, Balaklava	"	20/7/34
Not allotted	Lake View Melba 11th	J. M. Irwin, Mt. Barker	A.I.S.	25/6/34

OFFICIAL TEST—*continued.*

Age at Calving. Y.	M.	D.	Total Milk. Lbs.	Average Test. %	Total Butter-fat. Lbs.	Days Tested.	Sire.	Remarks.
BUTTERFAT STANDARD, 230LBS.—*continued.*								
2	8	13	4,480½	5·13	229·89	273	Roseworthy Pretty Duke	—
1	11	3	3,847½	5·95	228·98	240	Pembroke Mischief	†
2	1	2	6,463½	3·53	228·03	273	East View Sultan	—
2	5	17	5,928	3·80	225·40	273	Northfield Limelight's Prince	—
2	3	17	4,500½	5·00	225·24	273	Roseworthy Pretty Duke	—
1	11	3	4,065½	5·46	222·06	273	Roseworthy Pretty Duke	—
2	1	3	3,712½	5·90	219·16	240	Pembroke Twylish	Withdrawn
2	0	18	5,405	4·05	218·86	273	Park View Reward 2nd	—
2	1	16	5,024	4·31	216·61	273	Oakbank Classical	—
1	8	3	3,804	5·65	215·00	273	Para Vale Prince 2nd	—
2	1	6	4,948½	4·32	213·75	273	Wangara Melba's Limelight	—
1	7	1	3,906	5·45	212·94	273	Scrub View Twylish Lad	—
2	3	10	5,703	3·70	211·26	273	Melba's Limelight of Wangara	—
1	11	17	4,959½	4·25	210·54	273	Oakbank Classical	—
1	8	8	4,352	4·84	210·51	273	Ninyeri Prince	—
1	9	13	4,133	5·08	209·79	273	Channel View Prince	—
1	9	5	3,496	5·98	209·15	273	Bellefaire Blonde's Signal	—
2	1	12	5,305½	3·86	205·00	273	East View Sultan	—
1	8	25	4,455	4·52	201·53	240	Cudlee Creek Masterman	†
2	1	19	4,260	4·69	199·97	150	Werribee Masterman	Withdrawn
1	10	11	3,220	6·13	197·49	210	Bellefaire Blonde's Aristocrat	Sold
1	8	12	3,452½	5·71	197·04	273	Pembroke Mischief	—
1	11	14	4,867½	4·03	196·35	240	Oakbank Classical	†
2	2	18	3,465	5·59	193·71	240	Pembroke Mischief	Withdrawn
1	7	29	3,171½	5·94	188·28	273	Wollongbar Romancer	—
2	0	14	4,294½	4·33	186·06	273	Gowrie Park Ida's Laird	—
1	8	19	3,909	4·66	182·32	273	Silver Lad of Eudunda	—
1	2	17	3,800	4·75	180·66	273	Para Vale Prince 2nd	—
1	11	8	3,150	5·69	179·20	210	Para Wirra Collegian	Withdrawn
1	8	9	4,770	3·75	178·76	273	Gowrie Park Scottish Standard	—
2	0	15	4,930½	3·62	178·60	273	Northfield Janet's Royal	—
2	1	12	4,779	3·70	176·82	273	East View Sultan	—
2	1	13	4,200	4·17	175·00	210	Gowrie Park Scottish Dandy	Dried off
1	7	26	3,765	4·63	174·35	210	Balaklava Rhodesian's Repulse	Owner ceased testing
2	3	18	3,037½	5·48	166·51	273	Mercedes Sweet Duke of Glen Iris	—
1	5	21	2,785	5·93	165·28	240	Pembroke Twylish	†
1	9	12	3,030	5·42	164·28	210	Channel View Starlight	Dried off
1	11	8	2,865	5·68	162·65	180	Edmonton Butter King	Withdrawn
2	1	16	2,957½	5·16	152·53	240	Twylish of Para Wirra	Withdrawn
2	3	13	2,745	5·52	151·61	180	Lakeland Golden Masterpiece	Sold
2	4	17	2,406½	6·10	146·86	273	Glenlea Hilda's Valour	—
1	3	0	2,587½	5·49	142·14	180	Hampden Olive's King	Dry
1	8	18	3,135	3·36	105·28	120	Anama Alcartra Rex	Sold
2	1	26	1,905	4·71	89·65	90	Glen Echo Grey Lad	Died
1	2	16	1,515	5·21	78·92	120	Dalebank Wizard	Withdrawn
BUTTERFAT STANDARD, 250LBS.								
2	6	20	8,514	5·76	487·66	273	Dalebank Noble Duke	—
2	9	3	6,665½	6·17	411·46	273	Werribee Masterman	—
2	8	28	6,572	6·19	406·59	273	Wooroora King's Hero	—
2	10	19	7,521½	5·11	384·52	273	Timbungalung Airboy	—
2	9	17	6,938½	5·51	382·54	273	Lakeland Golden Masterpiece	—
2	11	29	6,784½	5·46	370·34	273	Baxter of Banyule	—
2	11	26	6,681	5·52	368·78	273	Woodside Palatine Boy	—
2	11	7	6,017	5·77	347·37	273	Overlook Favourite Remus	—
2	10	21	7,979	4·25	339·02	273	Clarendon Eyre Eminents Happy Husband	—
2	10	7	5,136	6·48	330·07	273	Overlook Favourite Remus	—
2	10	12	5,928	5·57	330·05	273	Wollingurry Cavalier's Silver King	—
2	8	27	6,490	5·06	328·41	273	Dalebank Producer 3rd	—
2	9	29	5,825½	5·64	328·32	273	Overlook Favourite Remus	—
2	6	12	5,424	6·02	326·39	273	Beauty's King of Somerville	—
2	8	20	6,772½	4·75	321·75	273	Delma Butter King	—
2	11	15	5,211½	6·07	316·46	273	Morella Anemone's Chief 5th	—
2	8	18	5,312½	5·95	316·14	273	Tuela Syra	—
2	8	28	5,993½	5·23	313·18	273	Bellefaire Blonde's Aristovrat	—
2	9	27	7,916	3·91	309·91	273	Lake View Royal	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
				SENIOR TWO-YEAR-OLDS—
Not allotted	Glen Belah Bertha	E. O. Hancock, Andrews	Ayrshire	7/8/34
41050	Mira Chana Sheila	H. B. Peters, Mt. Compass	Jersey	2/5/34
8283	Kiama Robin 4th	E. & A. Nicholls, Woodville	A.I.S.	11/8/34
41384	Ontario Nancy	T. B. Brooks, Clarendon	Jersey	29/4/34
Not allotted	Lake View Beauty 8th	J. M. Irwin, Mount Barker	A.I.S.	17/6/34
39737	Fernden Lady Combine	O. H. Woodward, Gilles Plains	Jersey	9/5/34
46522	Tuela Columbine	F. Coleman, Saddleworth	“	14/6/34
2980	Woodside Maisie	S W. Burns, Woodside	Guernsey	27/7/34
42231	Timbungalung Dewdrop	Mrs. A. M. Carruthers, Narrung	Jersey	25/4/34
39233	Channel View Primrose	Mrs. A. M. Carruthers, Narrung	“	25/7/34
43583	Cumberland Molly	L. W. Frost, Saddleworth	“	27/5/34
45564	Ontario Violet	T. B. Brooks, Clarendon	“	20/8/34
26521	Kyby Heroine	Government Farm, Kybybolite	Ayrshire	11/9/34
43914	Gambier Alden's Una	A. P. Spehr, Mount Gambier	Jersey	18/8/34
Not allotted	Wybalenna Tot Again	Mrs. A. H. Spackman, Long Flat	A.I.S.	18/8/34
41120	Morella Viola 3rd	H. R. Walsh, Mount Barker	Jersey	23/7/34
40132	Gum Hill Queen	P. O. Schutz, Eudunda	“	25/6/34
40555	Kirami Dawn	R. J. Laing, Gumeracha	“	19/8/34
26525	Kyby Oread	Government Farm, Kybybolite	Ayrshire	28/10/34
44391	Inman Nola	G. V. Rogers, Inman Valley	Jersey	13/2/35
Not allotted	Kyby Maggie 5th	Government Farm, Kybybolite	Ayrshire	19/10/34
				JUNIOR THREE-YEAR-OLDS—
34530	Pella Pamela	C. E. Verco, Mount Compass	Jersey	15/7/34
34645	Hampden Blonde's Countess	J. A. J. Pfitzner, Hampden	“	1/6/34
41505	Para Wirra Violet	J. H. Dawkins, Gawler	“	21/5/34
38616	Woodside Golden Maid	O. H. Woodward, Gilles Plains	“	19/9/34
34483	Sweet Haven Noble Duchess	J. M. Bray, Langhorne's Creek	“	14/9/34
40284	Inman Lady Grey	G. V. Rogers, Inman Valley	“	21/7/34
34647	Hampden Just It	J. A. J. Pfitzner, Hampden	“	19/8/34
39790	Glandore Lismore	W. A. Mueller, Ambleside	“	8/9/34
46529	Tuela Lobelia	F. Coleman, Saddleworth	“	18/8/34
46524	Tuela Diplacus	F. Coleman, Saddleworth	“	23/8/34
34549	Torrens Mystic Best	H. B. Peters, Mount Compass	“	16/5/34
5332	Dunleith Viola	Dunleith Pastoral Co., Ashbourne	A.I.S.	4/8/34
35311	Austral Park Swirl	H. R. Walsh, Mount Barker	Jersey	18/8/34
41268	Ninyeri Mayflower	E. L. Goode, Narrung	“	23/4/34
46530	Tuela Maple	F. Coleman, Saddleworth	“	2/8/34
44802	Lakeland Winette	H. R. Walsh, Mount Barker	“	8/6/34
34583	Alexandra Queen Clementine	A. Kelly, Milang	“	29/4/34
41498	Para Vale Cherry Starbright	A. J. Marrett, Saddleworth	“	26/8/34
5330	Dunleith Primula	Dunleith Pastoral Co., Ashbourne	A.I.S.	16/8/34
34580	Beetaloo Molly	Mrs E M. Johns, South Plympton	Jersey	30/8/34
39484	Cumberland Dewdrop's Lass	L. W. Frost, Saddleworth	“	1/9/34
40288	Inman Sally	G. V. Rogers, Inman Valley	“	16/8/34
41555	Pembroke Duchess 3rd	Mrs. C. W. Ansell, Bolivar	“	23/8/34
38659	Alexandra Bonny Janet	A. Kelly, Milang	“	1/8/34
44806	Lallawa Chieftain's Diana	J. F. Dodd, Meningie	“	20/7/34
46532	Tuela Spartium	F. Coleman, Saddleworth	“	1/8/34
45685	Pembroke Lady Lotus	Mrs. C W. Ansell, Bolivar	“	3/9/34
40131	Gum Hill Majesty	P. O. Schutz, Eudunda	“	9/9/34
40133	Gum Hill Rosette's Bell	P. O. Schutz, Eudunda	“	7/7/34
39483	Cumberland Damsel	L. W. Frost, Saddleworth	“	17/8/34
Not allotted	Kyby Ailsa	Govt. Farm Kybybolite	Ayrshire	27/8/34
“	Kyby Brilliant	Govt. Farm, Kybybolite	“	21/4/34
45684	Pembroke Gentle	Mrs C. W. Ansell, Bolivar	Jersey	15/9/34
45683	Pembroke Duchess 4th	Mrs. C. W. Ansell, Bolivar	“	21/9/34
Not allotted	Kyby Roslin	Govt. Farm, Kybybolite	Ayrshire	14/8/34
42842	Balaklava Collegian's Rosemary	A. E. Middleton, Balaklava	Jersey	12/10/34
Not allotted	Long Flat Cinderella 3rd	Mrs. A. H. Spackman, Long Flat	A.I.S.	20/12/34
“	Kyby Justice	Govt. Farm, Kybybolite	Ayrshire	31/10/34
8243	Kiama Mayfair	E A. Groth, Walker's Flat	A.I.S.	26/10/34
				SENIOR THREE-YEAR-OLDS.—
34663	Roseworthy Glimmer	Agricultural College, Roseworthy	Jersey	26/6/34
34510	Tuela Waratah 4th	F. Coleman, Saddleworth	“	23/8/34
34525	Pella Golden Lotus	W. A. Mueller, Ambleside	“	14/8/34
34500	Tuela Gaillardia	F. Coleman, Saddleworth	“	21/7/34
34493	Tuela Daisy	F. Coleman, Saddleworth	“	31/7/34
31029	Stonyfell Rosetta	J. W. Crompton, Victor Harbour	“	17/4/34
41890	Roseworthy Rose	Agricultural College, Roseworthy	“	25/9/34

OFFICIAL TEST—*continued.*

BUTTERFAT STANDARD, 250LBS.—*continued.*

Age at Calving.	Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.	%	Lbs.			
2 10 25	7,051½	4·33	305·35	273	Gowrie Park Dairyman	—
2 6 20	4,902½	6·15	301·44	273	Timbungalung Larkspurs Masterlark	—
2 11 16	8,550½	3·41	291·42	273	Pembroke of Greyleigh..............	—
2 8 18	5,372½	5·37	288·31	273	Dalebank Viola's Duke	—
2 9 14	7,758½	3·68	285·59	273	Lake View Gayboy	—
2 11 8	5,128½	5·54	284·15	273	Fernden Twylish Combination	—
2 10 14	3,967	7·02	278·44	273	Hampden Winsome King	—
2 11 4	4,473	6·03	269·85	273	Wollongbar Brutus	—
2 11 23	5,460	4·72	257·46	273	Timbungalung Butter King	—
2 6 11	4,626	5·54	256·13	273	Channel View Prince	—
2 9 7	4,473	5·55	248·26	273	Silver Lad of Eudunda	—
2 10 12	4,411½	5·47	241·29	273	Dalebank Viola's Duke	—
2 11 28	5,820	4·14	241·23	240	Ida's Laird of Gowrie Park	Dried off
2 7 29	4,426½	5·40	238 98	273	Les Sentes Lord Alden	—
2 9 7	6,108	3·88	236·99	273	Wangara Sunflower's Limelight	—
2 11 18	4,510	5·03	226·68	273	Anemone's Chief of Morella..........	—
2 10 29	4,392	5·07	222·72	273	Pella Northwood Cavalier	—
2 9 18	2,630	5·84	153·55	180	Lakeland Golden Masterpiece	Withdrawn
2 11 16	3,555	4·26	151·49	210	Loyalty of Bridge View	Dried off
2 7 7	2,100	5·04	105·81	120	Wooroora King's Admiral...........	Owner ceased testing
2 11 4	2,415	4·38	105·68	150	Loyalty of Bridge View	Dried off

BUTTERFAT STANDARD, 270LBS

Age at Calving.	Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
3 0 9	9,030	5·31	479·63	273	Dalebank Noble Duke	—
3 3 11	8,130½	5·89	478·90	273	Bellefaire Blonde's Aristocrat	—
3 2 23	8,215½	5·35	439·33	273	Para Wirra Sunshine Twylish II.	—
3 3 18	7,745	5 35	414·22	273	Pioneer's Lad....................	—
3 1 26	6,851	6·03	412·86	273	Dalebank Mercedes Duke	—
3 1 0	9,082½	4 32	392·72	273	Melford's Butter Lad of Pella	—
3 3 15	6,092½	6·26	381 65	273	Bellefaire Blonde's Aristocrat	—
3 2 16	6,213	6·08	377·79	273	Morella Tulip's Neat Lad	—
3 1 1	6,031½	6·12	368·86	273	Hampden Winsome King	—
3 0 29	6,421½	5·57	357·46	273	Hampden Winsome King	—
3 5 11	7,069½	4·98	351·74	273	Dalebank Producer 3rd	—
3 5 19	9,806	3·77	351·08	273	Sultan of East View	—
3 5 11	6,142½	5·65	347 14	273	Trecarne Sheik	—
3 5 5	7,132½	4·72	336 34	273	Hampden Mayflower King	—
3 0 21	6,711	4·94	331·45	273	Hampden Winsome King	—
3 3 5	7,080	4·64	328·51	240	Duke of Dalebank.................	†
3 1 2	5,366	6·02	323 28	273	Hampden Queen's Repeater	—
3 0 16	6,508½	4·92	320·56	273	Para Wirra Cherry Pylon	—
3 4 7	9,052	3·52	318·78	273	Sultan of East View	—
3 5 20	6,005½	5·25	315·11	273	Myrtle Bank Baxter	—
3 3 24	5,730½	5·49	314·57	273	Silver Lad of Eudunda	—
3 2 9	6,511½	4·54	295·68	273	Melfords Butter Lad of Pella	—
3 5 22	4,893	5·97	291·98	273	Para Wirra Twylish	—
3 0 3	5,338½	5·44	290·54	273	Hampden Queen's Repeater	—
3 0 1	5,740½	5·03	288·68	273	Chieftain 2nd of Dalebank	—
3 0 12	5,314	5·38	285·67	273	Hampden Winsome King	—
3 1 0	5,168	5·49	283·29	273	Twylish of Para Wirra	—
3 2 26	5,389½	5·24	282·68	273	Hampden Carnation's Lad	—
3 0 13	5,658	4·91	277·75	273	Hampden Carnation's Lad	—
3 0 13	4,938½	5·54	273·83	273	Silver Lad of Eudunda	—
3 0 9	5,886	4·37	257·88	273	Loyalty of Bridge View	—
3 0 26	6,021	4·05	244·12	273	Gowrie Park Scottish Dandy	—
3 0 4	4,525	4·96	224·62	240	Twylish of Para Wirra	Withdrawn
3 0 25	3,490	5·32	185·67	240	Twylish of Para Wirra	Withdrawn
3 0 4	4,965	3·72	185·16	240	Gowrie Park Scottish Dandy	Dried off
3 0 12	3,450	4·86	167·79	120	Balaklava Skylee's Collegian.........	Owner ceased testing
3 0 26	4,500	3·66	164·80	120	Wangara Ruth's Limelight	Died
3 0 0	3 195	4·80	153·39	150	Kyby Roger	Dried off
3 0 20	2,685	3·93	105·59	60	Pembroke of Greyleigh	Owner ceased testing

BUTTERFAT STANDARD, 290LBS.

Age at Calving.	Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
3 9 5	7,101	6·59	468·18	273	Mercedes Sweet Duke of Glen Iris ...	—
3 11 29	9,186	4·93	452·97	273	Brinkworth Chris	—
3 7 25	6,795½	6·07	412·57	273	Dalebank Noble Duke	—
3 10 26	6,298	6·48	407·99	273	Hampden Winsome King	—
3 8 22	6,858	5·95	407·92	273	Brinkworth Chris	—
3 7 28	6,780	6·01	407·68	273	Mack of Glenford	—
3 7 16	7,341	5·54	406·79	273	Roseworthy Templar	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
			SENIOR THREE-YEAR-OLDS—	
34480	Crofton Sunny Morn	H. & A. Bohme, Balhannah	Jersey	14/9/34
Not allotted	Anama Dominoe Belle	W. Hawker, Clare	Friesian	21/7/34
34639	Delma Duchess	E. W. Pfitzner, Eudunda	Jersey	30/8/34
Not allotted	Para Vale Molly	A. J. Marrett, Saddleworth	"	18/9/34
34582	Alexandra Janet's Olive	A. Kelly, Milang	"	29/7/34
Not allotted	Anama Transvaal Starlight	W Hawker, Clare	Friesian	26/5/34
34490	Channel View Miss Grey	Mrs. A. M. Carruthers, Narrung	Jersey	8/8/34
34590	Glen Ewin Coutance	Mrs. A. Bowman, Meningie	"	19/5/34
31027	Stonyfell Helen 7th	J. W. Crompton, Victor Harbour	"	10/4/34
Not allotted	Roseworthy Sciential 4th	Agricultural College, Roseworthy	"	24/8/34
34635	Delma Bonnie Countess	E. W. Pfitzner, Eudunda	"	23/8/34
Not allotted	Hazelbrook Elaine	J. N. Reid, Oakbank	Ayrshire	14/8/34
34528	Pella Magnet	W. A. Mueller, Ambleside	Jersey	25/9/34
34664	Roseworthy Lady 4th	Agricultural College, Roseworthy	"	23/6/34
31093	Brinkworth Rae	C. C. T. Ottens, Brinkworth	"	30/3/34
5421	Northfield Royal's Princess 2nd	Insp.-General Hospitals, Northfield	A.I.S.	14/9/34
5426	Long Flat Mermaid	Mrs. A. H. Spackman, Long Flat	"	8/5/34
35305	Austral Park Sparklett	H. R. Walsh, Mount Barker	Jersey	30/7/34
34642	Delma Twilight	E. W. Pfitzner, Eudunda	"	8/10/34
41554	Pembroke Dawn	Mrs. C. W. Ansell, Bolivar	"	11/8/34
Not allotted	Kyby Wynette	Government Farm, Kybybolite	Ayrshire	2/8/34
"	Balaklava Griselda Viola	A. E. Middleton, Balaklava	Friesian	1/10/34
26522	Kyby Kathleen	Government Farm, Kybybolite	Ayrshire	25/9/34
41553	Pembroke Bonny Lotus	Mrs. C. W. Ansell, Bolivar	Jersey	13/8/34
5418	Northfield Royal's Flirt 2nd	Insp.-General Hospitals, Northfield	A.I.S.	9/8/34
			JUNIOR FOUR-YEAR-OLDS—	
34633	Lakeland Capture	H. B. Peters, Mount Compass	Jersey	12/9/34
38614	Woodside Dreaming Satisfaction	A. B. Sieber, Eudunda	"	5/8/34
31016	Crofton Mavourneen	H. & A. Bohme, Balhannah	"	3/7/34
31136	Wooroora Lassie	A. B. Sieber, Eudunda	"	10/8/34
34667	Roseworthy Princess 41st	Agricultural College, Roseworthy	"	31/3/34
34517	Para Wirra Sunbeam 2nd	J. H. Dawkins, Gawler	"	2/6/34
Not allotted	Tuela Lavender	F. Coleman, Saddleworth	"	23/9/34
34584	Wooroora Lady Pride	A. Kelly, Milang	"	14/7/34
Not allotted	Tuela Dewdrop	F. Coleman, Saddleworth	"	5/9/34
41504	Para Wirra Iris Queen 2nd	J. H. Dawkins, Gawler	"	16/8/34
34508	Tuela Stephanotis	F. Coleman, Saddleworth	"	30/8/34
5329	Dunleith Millie	Dunleith Pastoral Co., Ashbourne	A.I.S.	3/8/34
31019	Sweet Haven Mercedes Bloom 2nd	J. M. Bray, Langhorne's Creek	Jersey	19/9/34
41266	Ninyeri Annette	E. L. Goode, Narrung	"	20/9/34
34651	Cudlee Creek Columbine's Pearl	G. D. Oster, Balaklava	"	8/6/34
40103	Greenoaks Sweetbread	W. A. Mueller, Ambleside	"	11/5/34
23555	Carracoorte Viola 19th	Insp.-General Hospitals, Northfield	Ayrshire	15/4/34
41556	Pembroke Madge	Mrs. C. W. Ansell, Bolivar	Jersey	27/8/34
Not allotted	Sunnybrae Melvina	E. O. Hancock, Andrews	Ayrshire	27/7/34
39477	Cudlee Creek Shy Girl	Mrs. W. A. Pool, Cudlee Creek	Jersey	19/8/34
5380	Burradale Pearl 5th	W. Nitschke & Son, Littlehampton	A.I.S.	23/8/34
5379	Burradale Miss Kelso 7th	W, Nitschke & Son, Littlehampden	"	18/5/34
2799	Glenlea Wenonah 2nd	E. T. Vinall, Brighton	Guernsey	6/7/34
5413	Liberton Charm	Insp.-General Hospitals, Northfield	A.I.S.	18/4/34
5373	Kiama Rose 2nd	E. and A. Nicholls, Woodville	"	1/4/34
Not allotted	Kyby Revel	Government Farm, Kybybolite	Ayrshire	15/8/34
"	Kyby Annie	Government Farm, Kybybolite	"	12/5/34
44808	Lallawa Chieftain's Mystery	J. F. Dodd, Meningie	Jersey	10/11/34
			SENIOR FOUR-YEAR-OLDS—	
34327	Melvin Viola 2nd	C. E. Verco, Mt. Compass	Jersey	10/8/34
31074	Glen Ewin Morn's May 2nd	Jas. McEwin, Houghton	"	1/8/34
31051	Cumberland Pride	L. W. Frost, Saddleworth	"	15/7/34
31052	Cumberland Silver Lady	L. W. Frost, Saddleworth	"	12/7/34
34278	Ear Park Rose	A. P. Spehr, Mt. Gambier	"	21/8/34
34672	Roseworthy Sciential 3rd	Agricultural College, Roseworthy	"	2/9/34
31104	Hampden Lady Olive	J. A. J. Pfitzner, Hampden	"	25/8/34
31082	Para Vale Queen	Mrs. D. G. Steven, Kooringa	"	23/4/34
31081	Para Vale Lucy	A. J. Marrett, Saddleworth	"	5/9/34

OFFICIAL TEST—*continued.*

Age at Calving.			Total Milk.	Aver-age Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Y.	M.	D.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 290LBS.—*continued.*								
3	6	29	7,508½	5·26	394·77	273	Butter King of Pella	—
3	10	25	11,053½	3·46	383·25	273	Totara Pontiac Dainty Boy	—
3	11	10	7,546½	5·08	383·23	273	Beauty's King of Somerville	—
3	8	0	8,147½	4·64	377·75	273	Para Wirra Cherry Pylon	—
3	11	19	7,083	5·15	364·62	273	Hampden Olive's King	—
3	7	17	9,040½	4·03	364·27	273	Longbeach Dutch Type 2nd	—
3	9	15	6,990½	5·19	363·08	273	Makarini of Dalebank	—
3	9	28	6,749	5·30	357·65	273	Brucevale Lord Fancy Starbright	—
3	8	28	6,181½	5·77	356·43	273	Mack of Glenford	—
3	6	17	6,463½	5·25	339·43	273	Mercedes Sweet Duke of Glen Iris	—
3	6	16	5,843½	5·62	328·39	273	Beauty's King of Somerville	—
3	11	20	8,245½	3·96	326·28	273	Beleura Federal	—
3	6	11	6,342	5·13	325·12	273	Werribee Combination	—
3	11	15	6,355½	5·11	324·97	273	Mercedes Sweet Duke of Glen Iris	—
3	11	5	5,491½	5·76	316·15	273	Hampden Olive's King	—
3	9	28	7,594	3·94	299·54	273	Royal's Success of Arrawatta	—
3	7	23	7,470	3·96	295·44	240	Ruth's Limelight of Wangara	†
3	6	10	5,235	5·49	287 60	240	Trecarne Sheik	†
3	6	9	4,410	5·18	225·97	180	Beauty's King of Somerville	Withdrawn
3	11	16	4.140	5·44	225·06	240	Twylish of Para Wirra	Withdrawn
3	11	26	5,355	4·06	217·33	240	Gowrie Park Scottish Dandy	Dried off
3	8	28	6,615	3·19	210·58	150	Glenowie Beets Griselda	Owner ceased testing
3	6	4	5,325	3·91	208·08	240	Gowrie Park Scottish Dandy	Dried off
3	11	27	3,877½	5·27	204·27	240	Twylish of Para Wirra	Withdrawn
3	6	6	4,795	3·55	170·24	240	Janet's Royal of Northfield	†
BUTTERFAT STANDARD, 310LBS.								
4	3	19	9,030½	5·61	507·00	273	Demetreus of Tuela	—
4	4	2	8,874	5·33	473·42	273	Dreaming Bob	—
4	2	22	8,345½	5·50	459·12	273	Butter King of Pella	—
4	5	28	7,896	5·58	440·30	273	Wollingurry Cavalier's Silver King	—
4	4	30	7,414½	5·49	407·26	273	Mercedes Sweet Duke of Glen Iris	—
4	1	13	9,339	4·30	401·80	273	Banyule Pylon	—
4	1	29	7,590½	5·25	398·37	273	Hampden Winsome King	—
4	0	22	6.037½	6·59	397·77	273	Wollingurry Cavalier's Silver King	—
4	1	13	6,735½	5·85	393·74	273	Brinkworth Chris	—
4	0	18	6,898½	5·38	371·29	273	Para Wirra Magiona's Twylish 2nd	—
4	0	23	7,097½	5·19	368 68	273	Hampden Winsome King	—
4	3	28	9,540	3 84	366·63	273	Merger of Melross	—
4	0	8	7,325	4·87	357·04	273	Dalebank Mercedes Duke	—
4	3	24	7,218	4·81	347·26	273	Morella Mercedes Sweet Duke	—
4	2	3	6,522	5·28	344·48	273	Producer 3rd of Dalebank	—
4	3	22	6,666½	5·16	344·09	273	Dalebank Commander 2nd	—
4	5	12	7,364	4·41	324·66	273	Bluebell's Pride of Glencourt	—
4	1	3	5,694½	5·58	317·73	273	Twylish of Para Wirra	—
4	2	10	8,220	3·83	314·84	240	Warook Federal	†
4	0	27	5,795½	5·38	311·78	273	Wompini Master Leon	—
4	5	19	8,103	3·76	304·96	273	Lovely's Earl of Glenthorn	—
4	1	15	6,538½	4·59	300·25	273	Lovely's Earl of Glenthorn	—
4	4	29	5,751	5·17	297·40	273	Glenlea Hilda's Valour 2nd	—
4	5	2	6,449	4·39	282·80	273	Limit of East View	—
4	1	12	6,627	4·09	270·77	273	Robin Hood of Kiama	—
4	4	4	6,540	3·75	245·22	240	Gowrie Park Scottish Dandy	Dried off
4	2	3	5,040	4·67	235·44	240	Gowrie Park Scottish Dandy	Dried off
4	4	0	3,570	4·85	173·28	180	Dalebank Chieftain 2nd	Withdrawn
BUTTERFAT STANDARD, 330LBS.								
4	10	29	11,815½	5·35	632·12	273	Retford Julian	—
4	11	27	8,754	5·04	441·05	273	Brucevale Lord Fancy Starbright	—
4	7	28	8,085	5·31	429·67	273	Silver Lad of Eudunda	—
4	8	8	7,966	5·23	417·02	273	Silver Lad of Eudunda	—
4	11	15	7,069½	5·82	411·53	273	Alert of Farringdon	—
4	6	17	7,375½	5·40	398·40	273	Mercedes Sweet Duke of Glen Iris	—
4	10	14	7,970½	4·97	395·82	273	Mayflower's Lad of Hampden	—
4	8	13	6,786½	5·77	391·65	273	Werribee Combination	—
4	7	25	7,846	4·69	367·70	273	Dalebank Milklad 12th	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
			SENIOR FOUR-YEAR-OLDS—	
29020	Glenalvie Sweet Dinah	A. P. Spehr, Mount Gambier	Jersey	13/9/34
31132	Gum Hill May	P. O. Schutz, Eudunda	"	23/5/34
31108	Hampden Melody	G. D. Oster, Balaklava	"	26/9/34
5378	Liberton Flash 2nd	E. & A. Nicholls, Woodville	A.I.S.	22/8/34
25195	Kyby Ornate	Government Farm, Kybybolite ...	Ayrshire	4/9/34
Not allotted	Talmont Stella..............	E. O. Hancock, Andrews	"	5/7/34
31155	Scrub View Cherry	A. B. A. Weckert, Brinkworth ...	Jersey	19/6/34
34675	Roseworthy Twilight	Agricultural College, Roseworthy..	"	6/4/34
2346	Northfield Limelight's Blossom ...	Insp.-General Hospitals, Northfield	A.I.S.	8/9/34
Not allotted	Fornleigh Pansy	Calf Club, Sutton Town	Friesian	15/8/34
40287	Inman Rose Marie	G. V. Rogers, Inman Valley......	Jersey	16/11/34
34473	Pembroke Patience	Mrs. C. W. Ansell, Bolivar	"	20/8/34
34674	Roseworthy Sunset	Agricultural College, Roseworthy..	"	17/7/34
5414	Liberton Flirt 3rd	Insp-General Hospitals, Northfield	A.I.S.	15/9/34
5382	Liberton Pretty Lady 2nd	W. Nitschke & Sons, Littlehampton	"	31/8/34
34604	Balaklava Collegian's Rosette	A. E. Middleton, Balaklava	Jersey	18/9/34
2533	Glenlea Fi Fi 3rd	E. T. Vinall, Brighton	Guernsey	2/5/34
31005	Pembroke Fashion	Mrs. C. W Ansell, Bolivar........	Jersey	5/7/34
31099	Hampden Carissa	J. A. J. Pfitzner, Hampden	"	25/1/35
Not allotted	Melara Princess	Mrs. D. G. Steven, Kooringa	"	7/10/34
44804	Lallawa Carnation 4th	J. F. Dodd, Meningie	"	12/4/35
			MATURE COWS—	
3657	Murray Glen Sylvia Topsy	C. J. Morris, Monteith	Friesian	12/8/34
34326	Melvin Duchess	C. E. Verco, Mount Compass	Jersey	12/9/34
2500	Murray Glen Echo Topsy	C. J. Morris, Monteith	Friesian	9/9/34
2502	Murray Glen Griselda Patch	C. J. Morris, Monteith	—	19/7/34
31050	Cumberland Duchess	L. W. Frost, Saddleworth	Jersey	17/7/34
34509	Tuela Swainsonia	F. Coleman, Saddleworth	"	13/9/34
10883	Belle 6th of Tabbagong	J. M. Irwin, Mount Barker	A.I.S.	31/7/34
3481	Glenowie Sylvia Patch	H. Mountstephen, Monteith	Friesian	19/7/34
Not allotted	Roads End Corcyra	W. Hawker, Clare	"	24/8/34
3160	Murray Glen Princess Royal	C. J. Morris, Monteith	"	15/9/34
23591	Woodside Morn	J. McEwin, Houghton	Jersey	22/8/34
28065	Tuela Daffodil 2nd	F. Coleman, Saddleworth	"	25/7/34
28138	Dalebank Sweetbread...........	W. A. Mueller, Ambleside	"	20/8/34
23622	Roseworthy Princess 26th	Agricultural College, Roseworthy..	"	27/4/34
31030	Para Wirra Eileen 3rd	J. H Dawkins, Gawler	"	24/8/34
25028	St. Helier's Mystery	J. F. Dodd, Meningie	"	8/5/34
31033	Para Wirra Millie's Goldstream 2nd	J. H. Dawkins, Gawler	"	5/5/34
28057	Crofton Bonnie Kate	H. & A. Bohme, Balhannah	"	18/8/34
23700	El Rimal Surprise	E. O. Hancock, Andrews	Ayrshire	31/7/34
18373	Mayflower Jellicoe 2nd of Illawarra	Mrs. A. H. Spackman, Long Flat..	A.I.S.	10/9/34
34654	Wompini Leonie 7th.............	O. H. Woodward, Gilles Plains ..	Jersey	6/9/34
20847	Roseworthy Flora	Agricultural College, Roseworthy..	"	14/8/34
1199	Brush Grove Albertina 2nd	P. J. A. Braendler, Ambleside	A.I.S.	29/8/34
23617	Roseworthy Dawn	Agricultural College, Roseworthy..	Jersey	7/5/34
3311	Anama Segis Bloom	W. Hawker, Clare	Friesian	15/8/34
25051	Roseworthy Erudite 2nd	Agricultural College, Roseworthy..	Jersey	13/7/34
20760	Doreen of Pella	A. B. Sieber, Eudunda	"	28/7/34
Not allotted	Murray Glen Netherland Princess .	C. J. Morris, Monteith	Friesian	11/4/34
23632	Pella Lady Lotus	A. Kelly, Milang	Jersey	15/7/34
28052	Pembroke Duchess 2nd	Mrs. C. W. Ansell, Bolivar	"	7/9/34
23605	Hampden Rhonda	C. C. T. Ottens, Brinkworth	"	4/6/34
24853	Hampden Maybee	J. A. J. Pfitzner, Hampden.......	"	13/4/34
Not allotted	Cotswold Colas	R J. Laing, Gumeracha	"	25/9/34
28058	Crofton Sunflower	H & A. Bohme, Balhannah	"	18/7/34
3479	Glenowie Princess Patch	H. Mountstephen, Monteith	Friesian	15/7/34
2499	Murray Glen Echo Sylvia	C. J. Morris, Monteith	"	17/5/34
20740	Sweetbriar of Tuela	F. Coleman, Saddleworth	Jersey	10/10/34
24972	Cumberland Princess	L. W. Frost, Saddleworth	"	16/8/34
Not allotted	Glenowie Echo Segis............	A. E. Middleton, Balaklava	Friesian	29/5/34
20825	Judith of Talunga	C. C. T. Ottens, Brinkworth	Jersey	12/7/34
34276	Willis Vale Twinkle	A. P. Spehr, Mount Gambier	"	12/8/34
3214	Waughope Redwing 4th	Dunleith Pastoral Co., Ashbourne	A.I.S.	11/9/34
24865	Scrub View Daffodil	A. B. A. Weckert, Brinkworth ...	Jersey	30/5/34
Not allotted	Kyby Gladys	Government Farm Kybybolite ...	Ayrshire	22/8/34
23626	Roseworthy Roseal	Agricultural College Roseworthy..	Jersey	19/4/34
23567	Willow Farm Millie 31st	A. J. Marrett Saddleworth	"	13/7/34
Not allotted	Waughope Slasher 4th	Dunleith Pastoral Co. Ashbourne	A.I.S.	12/4/34
"	Liberton Betsy	J. M. Irwin Mt. Barker..........	"	24/5/34

OFFICIAL TEST—*continued.*

Age at Calving. Y. M. D.	Total Milk. Lbs.	Average Test. %	Total Butter-fat. Lbs.	Days Tested.	Sire.	Remarks.
BUTTERFAT STANDARD, 330LBS.—*continued.*						
4 8 16	6,540½	5·41	354·25	273	Werribee Fancy Masterpiece	—
4 8 14	6,386½	5·47	349·09	273	Hampden Carnation's Lad	—
4 6 3	6,701½	5·03	336·87	273	Hampden Olive's King	—
4 10 29	10,332	3·19	329·79	273	Mariner of Greyleigh	—
4 11 6	7,485	4·28	320·06	240	Loyalty of Bridge View	Dried off
4 8 4	6,645	4·72	313·53	273	Beleura Captain	—
4 11 2	5,329½	5·85	311·54	273	Holly's King of Hampden	—
4 8 27	5,349½	5·71	305·60	273	Courtier of Dalebank	—
4 11 12	6,991½	4·26	297·60	273	Melba's Limelight of Wangara	—
4 9 8	7,992	3·53	282 15	273	Fernleigh Dutch Hero	—
4 6 4	4,530	6·12	277·40	210	Makarini 2nd of Dalebank	Owner ceased testing
4 8 9	5,679	4·84	274·86	273	Twylish of Para Wirra	—
4 6 29	4,917	5·32	261·47	273	Mercedes Sweet Duke of Glen Iris	—
4 10 22	6,486½	3·89	252·41	273	Mariner of Greyleigh	—
4 8 17	6,435	3·65	234·85	240	Belmont of Darbalara	Withdrawn
4 11 5	4,222½	4·77	201·51	150	Balaklava's Skylee's Collegian	Owner ceased testing
4 7 6	3,101	6·45	199·94	273	Glenlea Hilda's Valour 2nd	—
4 9 29	4,357½	4·49	195·60	273	Twylish of Para Wirra	—
4 6 24	2,985	5·59	166·89	90	Hampden Olive's King	Sold
4 8 27	3,810	4·27	162·75	180	Melara Royal Silvermine	Withdrawn
4 6 22	990	5·67	56·10	30	Dalebank Chieftain 2nd	Withdrawn
BUTTERFAT STANDARD, 350LBS.						
6 2 29	23,458½	3·27	766· 87	273	River Glen Lord Echo Griselda	—
6 10 29	13,134	5·51	723·21	273	Retford Julian	—
8 2 5	17,064	3·44	587·65	273	River Glen Lord Echo Griselda	—
8 4 2	14,440½	4·01	579·34	273	River Glen Lord Echo Griselda	—
5 4 28	11,586	4·80	555·85	273	Silver Lad of Eudunda	—
5 — 1	9,457	5·77	545·64	273	Baron of Dalebank	—
8 8 30	13,683	3·97	542·98	273	Violet's Emperor of Hill View	—
7 8 28	13,999½	3·76	525·73	273	River Glen Sir Pietje Griselda	—
5 3 28	15,838½	3·28	519·61	273	Rosevale King Sylvia Posch	—
7 11 17	13,164	3·85	507·05	273	River Glen Lord Echo Griselda	—
8 11 1	10,768	4·69	504·97	273	Montrose Sultan	—
6 11 28	7,382½	6·73	496·93	273	Maid's Success of Linden	—
6 10 4	9,009	5·37	484·13	273	Mercedes Sweet Duke of Glen Iris	—
7 5 8	8,028	5·82	467·59	273	Courtier of Dalebank	—
5 5 9	8,109	5·63	456·23	273	Para Wirra Chieftain	—
7 5 24	7,845	5·77	452·58	240	Nada's Chief of Linden	Withdrawn
5 2 20	9,036	4·97	449·30	273	Para Wirra Chieftain	—
5 2 19	7,606	5·88	447·52	273	Butter King of Pella	—
5 0 13	10,851½	4·12	446·94	273	Gowrie Park Dairyman	—
9 4 20	10,938½	4·08	445·78	273	Fussy's Jellicoe of Hill View	—
5 1 26	7,900	5·45	430·88	273	Werribee Masterman	—
8 10 4	7,239	5·93	429·29	273	King Solomon of Dalebank	—
6 3 21	11,428½	3·73	426·49	273	Ardee of The Hill	—
7 4 0	8,206½	5·19	425·88	273	Lad of Linden	—
5 9 17	13,263	3·21	425·64	273	Inavale Lady's Pride	—
6 3 21	6,972	6·09	424·45	273	King Solomon of Dalebank	—
8 1 4	8,482½	4·91	416·75	273	Governor Grey of Pella	—
5 4 28	12,345	3·36	415·39	273	Longbeach Netherland King 2nd	—
7 4 2	6,676½	6·19	413·29	273	Werribee Starbright's Fancy	—
6 3 27	7,900	5·16	408·00	273	Twylish of Para Wirra	—
8 0 0	7,965	5·11	406·69	273	Carnation's Lad of Dalebank	—
7 10 3	7,218½	5·58	402·84	273	Carnation's Lad of Dalebank	—
6 1 24	7,972½	5·00	398·60	273	Duke of Dalebank	—
5 4 19	8,238	4·82	396·97	273	Butter King of Pella	—
7 2 5	12,318½	3·22	396·96	273	Murray Glen Echo Griselda	—
8 5 28	11,631	3·39	393·99	273	River Glen Lord Echo Griselda	—
9 6 9	8,025	4·89	392·61	240	Maid's Success of Linden	Sold
6 5 7	7,458	5·23	390·26	273	King Chris of Penrhyn	—
6 7 1	12,522½	3·10	389·28	240	Glenowie Beets Griselda	†
9 8 10	8,101½	4·77	386·66	273	Molar Chief of Banyule	—
5 0 5	9,450	4·05	382·36	273	Camellia's King of Willis Vale	—
5 6 23	10,776	3·55	382·24	273	Garnet of Brush Grove	—
6 9 1	6,965	5·45	379·76	273	Holly's King of Hampden	—
5 1 7	8,292½	4·54	376·27	273	Loyalty of Bridge View	—
7 4 27	5,934	6·32	375·32	273	Courtier of Dalebank	—
8 0 0	6,898	5·40	372·57	273	Molly 5th's Audrey Twylish of Banyule	—
5 1 14	9,980	3·72	371·14	273	Garnet of Brush Grove	—
7 8 21	9,545	3·87	369·50	240	Limit of East View	Withdrawn

PURE-BRED COWS COMPLETED

MATURE COWS—

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
31122	Roseworthy Fay	Agricultural College Roseworthy	Jersey	3/8/34
16387	Kyby Ina	Government Farm, Kybybolite	Ayrshire	22/7/34
24084	Kyby Maggie 4th	Government Farm, Kybybolite	"	5/4/34
24823	Penrhyn Princess Hermia	H. R. Walsh, Mount Barker	Jersey	25/8/34
28051	Pembroke Daisy	Mrs. C. W. Ansell, Bolivar	"	26/8/34
31083	Havec Tulip	Mrs. C. E. Mayger, Kapunda	"	26/5 34
20774	Mistletoe 2nd of Beetaloo	Mrs. E. M. Johns, South Plympton	"	16 8/34
24857	Wooroora Bonnnie Pearl	A. B. Sieber, Eudunda	"	9/4/34
3221	Wingeewah Sadie 2nd	P. J. A. Braendler, Ambleside	A.I.S.	24/8/34
Not allotted	Glenowie Netherland Pauline	H. Mountstephen, Monteith	Friesian	0/5/34
34662	Penrhyn Lady Marge 13th	G. V. Rogers, Inman Valley	Jersey	25/6/34
31026	Stoneyfell Connie 2nd	J. W. Crompton, Victor Harbour	"	2/9/34
2461	Glenowie Pauline Griselda	H. Mountstephen, Monteith	Friesian	8/5/34
23621	Roseworthy Princess 25th	Agricultural College, Roseworthy	Jersey	8/9/34
20849	Roseworthy Princess 21st	Agricultural College, Roseworthy	"	27/8/34
Not allotted	Penrhyn Lady Hermia 27th	G. V. Rogers, Inman Valley	"	21/7/34
24991	Brinkworth Ruby	C. C. T. Ottens, Brinkworth	"	5/6/34
17884	Primrose of Toora	Insp.-General Hospitals, Northfield	A.I.S.	28/7/34
28090	St. Helier's Barbara	J. F. Dodd, Meningie	Jersey	2/7/34
1682	Tabbagong Beauty 10th	J. M. Irwin, Mount Barker	A.I.S.	22/9/34
18424	Kyby Maggie 3rd	Government Farm, Kybybolite	Ayrshire	25/9/34
33597	Willis Vale Briar Rose	A. P. Spehr, Mount Gambier	Jersey	28/6/34
28166	Morella Lilly	Mrs. D. G. Steven, Kooringa	"	16/6/34
21831	Kyby Barbara 2nd	Government Farm, Kybybolite	Ayrshire	16/7/34
Not allotted	Hazelbrook Trinket	J. N. Reid, Oakbank	"	21/8/34
18348	Cinderella 16th of Greyleigh	Mrs. A. H. Spackman, Long Flat	A.I.S.	19/9/34
34547	Torrens Cleopatra	H. B. Peters, Mount Compass	Jersey	27/4/34
13105	Millie 10th of Melross	Dunleith Pastoral Co., Ashbourne	A.I.S.	30/8/34
23562	Stonyfell Beatrice	J. W. Crompton, Victor Harbour	Jersey	31/3/34
18741	Oakbank Hopeful	J. N. Reid, Oakbank	Ayrshire	5/8/34
28164	Morella Belle 4th	H. R. Walsh, Mount Barker	Jersey	14/7/34
24843	Penrhyn Lady McEwin 23rd	Mrs. A.M. Carruthers, Narrung	"	17/8/34
31125	Roseworthy Princess 36th	Agricultural College, Roseworthy	"	28/4/34
34601	Palpara Connie	Mrs. C. E. Mayger, Kapunda	"	10/9/34
21843	Kyby Winsome	Government Farm, Kybybolite	Ayrshire	10/9/34
31148	Morella Damsel 4th	Mrs. D. G. Steven, Kooringa	Jersey	15/5/34
28062	Ontario Kate's Twylish	T. B. Brooks, Clarendon	"	19/5/34
Not allotted	Columbine's Lady 7th of Glen Ewin	H. R. Walsh, Mount Barker	"	26/7/34
20752	Millie 28th of Willow Farm	A. B. A. Weckert, Brinkworth	"	10/8/34
21836	Kyby Madge 2nd	Government Farm, Kybybolite	Ayrshire	21/8/34
13107	Melba 5th of Melross	Dunleith Pastoral Co., Ashbourne	A.I.S.	30/9/34
14310	Carnation 2nd of Oakhill	Mrs. C. E. Mayger, Kapunda	Jersey	19/6/34
28060	Ontario Firefly	T. B. Brooks, Clarendon	"	11/7/34
24000	Hazelbrook Eva	J. N. Reid, Oakbank	Ayrshire	14/8/34
20221	Gowrie Park Lolette	J. N. Reid, Oakbank	"	26/8/34
31101	Hampden Jessamine	E. W. Pfitzner, Eudunda	Jersey	14/10/34
Not allotted	Hazelbrook Dulcie	J. N. Reid, Oakbank	Ayrshire	8/12/34
24838	Gum Hill Rosette	P. O. Schutz, Eudunda	Jersey	14/7/34
Not allotted	Hazelbrook Elva	J. N. Reid, Oakbank	Ayrshire	27/8/34
26847	Winslade Gem	E. O. Hancock, Andrews	"	28/10/34
28147	Hampden Janet	A. Kelly, Milang	Jersey	8/8/34
8465	Waratah of Eastview	Insp.-General Hospitals, Northfield	A.I.S.	23/7/34
24085	Kyby Roma	Government Farm, Kybybolite	Ayrshire	12/10/34
14763	Tot of Ben Lomond	Insp.-General Hospitals, Northfield	A.I.S.	14/9/34
10594	Gum Hill Mayflower	P. O. Schutz, Eudunda	Jersey	10/6/34
28068	Freezia 2nd of Tuela	Mrs. D. G. Steven, Kooringa	"	20/12/34
15184	Oakbank Alleyne	Government Farm, Kybybolite	Ayrshire	12/11/34
23612	Hill Farm Lady	D. Fitzgerald, Edwardstown	Jersey	21/11/34

† NOTE.—Tenth tests were required for the cows marked thus :—†, but could not be obtained

CORRECTION.—Mr. A. Kelly's cow " Wooroora Dorette " was published in the list for the half-year ended
figures are

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
28157	Wooroora Dorette	A. Kelly, Milang	Jersey	27/2/34

OFFICIAL TEST—*continued.*

Age at Calving.	Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 330LBS.—*continued.*						
5 8 25	6,828	5·40	368·50	273	King Solomon of Dalebank	—
7 6 21	8,094	4·52	366·16	273	Loyalty of Bridge View	—
5 1 18	9,657	3·78	365·59	273	Loyalty of Bridge View	—
7 8 11	7,186½	5·07	364·08	273	Bramble's Lord of Linden	—
5 11 25	5,464½	6·64	363·05	273	Twylish of Para Wirra	—
5 1 12	7,048½	5·12	360·97	273	Hampden Carnation's Lad	—
8 11 20	7,350	4·91	360·91	273	Fuchsia Boy of Linden	—
5 10 19	7,834½	4·58	358·91	273	Melfords Butter Lad of Pella	—
5 0 4	10,144½	3·51	356·57	273	Daphne's Defiance of Hill View	—
5 4 0	10,582½	3·33	352·29	273	Longbeach Netherland King 2nd	—
6 2 7	6,843	5·13	351·31	273	Socrates of Rockness	—
5 1 11	6,712½	5·22	350·68	240	Baxter of Banyule	†
8 2 4	8,535	4·11	350·46	240	River Glen Sir Pietje Griselda	Dried off
7 10 12	7,335	4·75	348·36	273	King Solomon of Dalebank	—
8 9 3	6,435	5·37	345·30	240	King Solomon of Dalebank	†
6 6 16	7 057½	4·84	341·70	273	Socrates of Rockness	—
6 0 18	6,858	4·98	341·27	273	Beauty's King of Somerville	—
6 5 25	8,609½	3·95	340·23	273	Iris 5th's Superb of Toora	—
7 9 6	6,751½	5·03	339·97	273	Nada's Chief of Linden	—
6 9 15	8,206½	4·13	339·27	273	Daisy's Gift of Hill View	—
6 9 27	9,015½	3·76	338·72	273	Loyalty of Bridge View	—
5 9 28	6,381	5·18	330·51	273	Camellia's King of Willis Vale	—
6 3 14	6,395	5·33	341·11	240	Springmead General	†
6 4 19	8,613	3·82	329·05	273	Ida's Laird of Gowrie Park	—
5 3 28	7,608	4·29	326·35	273	Oakbank Chiming Bell	—
6 9 23	9,621	3·37	324·01	273	Alma's Jellicoe of Hillcrest	—
6 1 0	6,693	4·84	323·66	273	Dalebank Producer 3rd	—
6 7 16	8,796½	3·65	321·35	273	Dainty's Triumph of Melross	—
6 11 20	5,637	5·58	314·32	273	Boroni of Rockness	—
7 7 25	7,050	4·43	312·55	240	Aerial of Oakbank	Dried off
6 0 13	6,403½	4·82	308·85	273	Mercedes Sweet Duke of Glen Iris	—
7 7 20	5,707½	5 39	307·47	273	Bramble's Lord of Linden	—
5 5 23	5,427	5·55	301·17	273	Roseworthy Twylish	—
7 2 16	6,006½	4·98	299·34	273	Trojan of Dalebank	—
6 5 3	8,037	3·69	296·69	273	Loyalty of Bridge View	—
5 2 11	5,985	4·86	291·00	240	Morella Anemone's Chief 2nd	Dried off
5 9 11	5,918½	4·89	289·46	273	Cherry's Twylish of Para Wirra	—
8 2 6	4,287½	6·74	288·89	240	Trixie's Lad of Glen Ewin	†
9 11 8	6,147	4·67	286·97	273	Molly 5th's Audrey Twylish of Banyule	—
6 1 26	7,010	4·07	285·44	240	Loyalty of Bridge View	Dried off
6 5 19	8,025	3·48	279·64	240	Merger of Melross	Withdrawn
11 11 4	4,942½	5·62	277·93	273	Grey Sprite of Linden	—
6 0 4	5,305	4·91	260·53	210	Mercedes Sweet Duke of Glen Iris	Sold
5 10 14	6,720	3·85	258·58	240	Hazelbrook Cheerio	Sold
7 0 28	7,251	3·52	255·08	273	Loyal's Scot of Gowrie Park	—
5 3 29	4,575	5·46	249·57	210	Maid's Success of Linden	Withdrawn
5 7 15	5,970	4·13	246·62	180	El Rimal Count Rival	Withdrawn
8 10 23	5,335	4·58	244·37	210	Excamillo of Pella	Withdrawn
5 9 15	5,475	4·22	231·14	210	Oakbank Spotlight	Sold
7 1 22	6,172½	3·74	230·89	180	Chudleigh of Brook Hill	Withdrawn
5 11 23	4,455	4·96	220·88	150	Beauty's King of Somerville	Dried off
10 7 14	6,078½	3·56	216·35	273	Limit of East View	—
5 1 10	4,260	4·66	198·48	210	Ida's Laird of Gowrie Park	Dried off
10 7 13	5,075	3·71	188·19	240	Hayliss's Joffre of Wangara	†
13 1 8	3,125	5·50	171·82	210	Crusoe of Gum Hill	Withdrawn
6 4 4	2,640	4·80	126·77	150	Tuela Eric	Dried off
10 11 2	2,895	4·02	116·45	120	Bright's Jock of Oakbank	Dried off
7 10 4	970	4·79	46·42	90	Prince Silvermine of Pella	Sold

therefore the cows concerned have been credited with only 240 days production.

31st December, 1934, as a mature cow, whereas she was actually a senior four-year old. Her production hereunder.

Age at Calving.	Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.	%	Lbs.			
4 9 4	6 156½	5·99	368·57	273	Wollingurry Cavalier's Silver King	—

BUTTERFAT TESTS (OFFICIAL) FOR HALF-YEAR ENDED 30TH JUNE, 1935, OF PURE AND OF FOUNDATION

Particulars of Registration.	Name of Cow.	Owner and Address.	Breed.	Calved.
				JUNIOR TWO-YEAR-OLDS—
Appendix Calf Roll	Glenbank Poppy	J. M. Irwin, Mount Barker	A.I.S	19/5/34
"	Inman Rose	G. V. Rogers, Inman Valley	Jersey	5/8/34
"	Northfield Royal Duchess	Insp.-General Hospitals, Northfield	A.I.S.	4/9/34
"	Kyby Brenda	Government Farm, Kybybolite	Ayrshi re	15/9/34
"	Kyby Oriel	Government Farm, Kybybolite	"	8/10/34
"	Auldearn Noble's Fancy	Mrs. D. G. Steven, Kooringa	Jersey	4/11/34
"	Ontario Tulip	T. B. Brooks, Clarendon	Jersey	3/1/35
				SENIOR TWO-YEAR-OLDS—
Calf Roll	Roseworthy Princess 48th	Agricultural College, Roseworthy	Jersey	3/5/34
"	Kyby Bland	Government Farm, Kybybolite	Ayrshire	8/2/35
"	Balaklava Collegian's Lulu	A. E. Middleton, Balaklava	Jersey	—/2/35
				JUNIOR THREE-YEAR-OLDS—
Appendix	Glenbank Betsy	J. M. Irwin, Mount Barker	A.I.S.	13/7/34
Calf Roll	Balaklava Repulse Collette	A. E. Middleton, Balaklava	Jersey	—/1/35

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION

RESULTS OF BUTTERFAT TESTS FOR JULY, 1935.

Herh No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during July.	Per Cow during July.	Per Cow March to July.	Per Herd during July.	Per Cow during July.	Per Cow March to July.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	28	22·03	13,525½	483·05	1,842·70	714·44	25·52	94·86	5·28
9/C ..	14	9·29	5,937	424·07	2,068·97	259·05	18·50	86·72	4·36
9/D ..	29·39	22·58	10,107	343·87	2,195·26	572·04	19·46	119·33	5·66
9/E ..	12·18	6·32	3,119	257·12	2034·74	148·01	12·20	99·01	4·75
9/F ..	18	14·81	11,100½	618·75	1,999·95	456·13	25·44	88·06	4·10
9/G ..	25·29	12·39	6,698½	264·87	2,038·54	360·47	14·25	106·38	5·38
9/I ..	28·48	21·77	17·544½	618·93	1,774·09	754·48	26·41	77·45	4·37
9/J...	21	15·45	10,449	497·57	1,666·98	451·98	21·52	71·14	4·33
9/L ..	29·42	19·29	12,074	414·94	1,622·51	530·09	18·19	66·07	4·44
9/O ..	25	15·52	8,541½	341·66	1,912·78	435·38	17·42	90·70	5·10
9/P ..	44·10	39·52	25,030½	567·58	1,701·73	1,268·22	28·76	86·30	5·07
9/T ..	15	8·74	5,044	336·27	1,547·83	227·26	15·15	69·92	4·51
9/W .	29	23·29	16·493½	568·74	2,740·94	741·95	25·58	118·92	4·50
9/X ..	9	6·29	3,306½	367·39	1,790·45	180·79	20·09	92·86	5·49
9/Y ..	11	8·65	5,473	497·51	2,039·52	220·48	20·04	82·07	4·03
9/Z ..	12	11	3,679	306·58	1,459·92	176·22	14·69	71·23	4·79
9/AA	15·65	12·65	6,368	406·90	1,991·42	344·12	21·99	112·31	5·40
9/BB	24	13·77	7,381½	307·56	1,271·34	402·90	16·79	66·72	5·46
9/CC .	18	17	12,229½	679·42	2,301·96	626·29	34·79	119·43	5·12
9/FF	19	8·61	6,465½	340·28	552·19	230·87	12·15	20·16	3·49
9/EE	43	29·90	12,606½	293·17	968·64	646·05	15·02	50·60	5·12
9/DD	17	12·39	3,589½	211·15	867·36	182·14	10·71	44·56	5·07
Means	22·16	15·97	9,398·35	424·16	1,797·46	451·33	20·37	87·48	4·80

BREEDS WHICH, ON 30TH JUNE, 1935, WERE REGISTERED IN THE CALF ROLL ONLY, AND APPENDIX COWS.

Age at Calving.	Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 230LBS.						
2 5 24	7,056	4·23	298·50	273	Glenbank Alick	—
1 8 16	4,911	5·82	285·77	273	Wooroora King's Admiral	—
2 2 10	4,103	4·04	165·58	273	Northfield Janet's Royal	—
2 2 8	4,129½	3·87	159·90	273	Gowrie Park Leyland	—
2 1 13	1,665	4·51	75·06	180	Gowrie Park Scottish Dandy	Dry
1 8 14	1,425	4·93	69·94	120	Nancy's Noble (Imp.)................	Dry
1 11 16	1,425	4·43	63·18	90	Ontario Millie's Duke	Withdrawn
BUTTERFAT STANDARD, 250LBS.						
2 9 24	4,088	5·82	237·97	273	Roseworthy Majesty	—
2 9 28	2,235	4·40	98·42	120	Gowrie Park Leyland	Dead
2 11 0	780	4·55	35·46	30	Balaklava Skylee's Collegian	Owner ceased testing
BUTTERFAT STANDARD, 270LBS.						
3 3 17	5,240	3·98	208·50	210	Glenbank Alick	—
3 4 0	1,980	4·67	92·54	60	Balaklava Rhodesian's Repulse	Owner ceased testing

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR JULY, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during July	Per Cow during July	Per Cow December to July	Per Herd during July	Per Cow during July	Per Cow December to July	
			lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	16·55	16·26	14,646	884·95	3,148·52	683·30	41·29	157·23	4.67
6/C ..	17·74	9·87	9,070½	511·40	3,577·31	383·83	21·64	154·94	4·23
6/Y .	18	7	2,418	186·00	2,906·81	105·96	8·15	122·85	4·38
6/Ff .	27	17·87	11,036½	408·62	4,575·90	465·70	17·24	191·86	4·27
6/Kk	18	13·97	6,040	335·56	3,528·55	261·43	14·52	137·19	4·33
6/Ll .	21·06	12·81	3,678	174·64	3,454·10	140·23	6·66	128·97	3·81
6/Oo .	24·48	17·35	10,058½	410·68	4,675·03	428·65	17·51	201·65	4·27
6/Ss .	19	15·97	12,734	670·21	5,896·13	498·59	26·24	230·25	3·92
6/Tt .	23·97	17·26	11,644	485·77	4,991·65	505·30	21·08	210·93	4·34
6/Vv .	30	25·74	18,220½	607·35	5.389·74	903·07	30·10	252·62	4·96
6 Xx	26·77	20·71	11,633½	434·57	5,029·71	445·95	16·66	204·09	3·83
6/Ccc	25	14·81	7,661½	306·46	3,183·93	346·68	13·87	141·00	4·52
6/Ddd	23·71	13·39	8,266½	348·65	3,895·30	376·56	15·88	172·80	4·56
6/Jjj	23·42	19·42	13,406	572·41	5,083·82	671·22	28·66	242·76	5·01
6/Nnn	36	25·74	14,354	398·72	4,264·49	609·70	16·94	187·82	4·25
6/Mmm	7	7	4,479½	639·93	5,457·30	206·89	29·56	244·90	4·62
6/Ooo	22·68	20·82	15,253½	672·55	2,144·50	625·31	27·57	89·10	4·10
6/Qqq	16·03	10·97	10,899	679·91	1,229·91	389·11	24·27	45·04	3·57
6/Ppp	17·61	17·32	14,950½	848·97	1,916·97	603·19	34·25	78·76	4·03
Means	21·53	15·99	10,549·74	490·06	4,485·21	455·30	21·15	190·57	4·32

NARRUNG HERD TESTING ASSOCIATION.

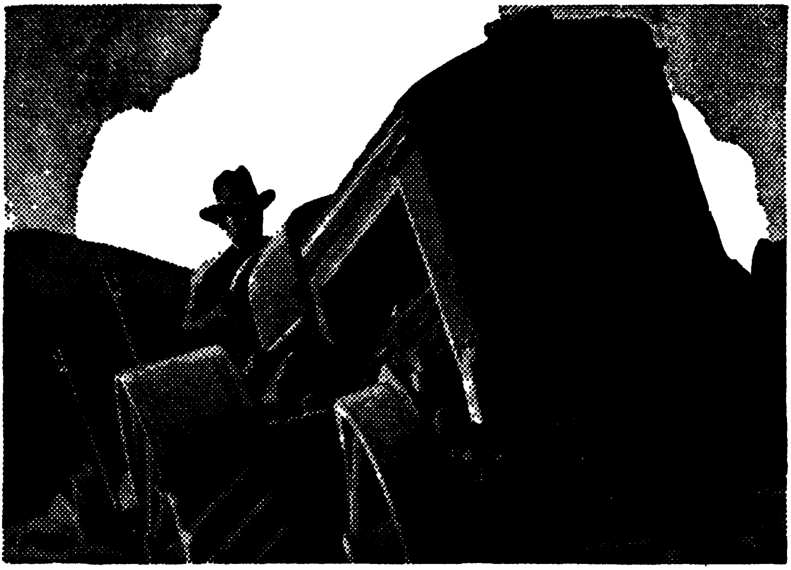
RESULTS OF BUTTERFAT TESTS FOR JULY, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during July.	Per Cow during July.	Per Cow October to July.	Per Herd during July.	Per Cow during July.	Per Cow October to July.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
/C ..	31·58	30·48	25,460½	806·22	5,027·09	1,365·40	43·24	263·25	5·36
/D ..	33·26	25·77	17,354	523·53	4,400·89	909·06	27·41	236·22	5·33
/E ..	34·29	26·45	18,237¼	531·85	4,684·30	940·29	27·42	242·68	5·16
/R ..	69·26	57·06	43,530½	628·51	4,239·70	1,948·45	28·13	190·02	4·48
/Ee	14·77	4·29	3,476½	235·37	4,041·36	171·94	11·64	206·49	4·95
/Z .	29·26	28·68	25,654	876·76	7,320·87	1,396·87	47·74	376·70	5·45
/Ww	20	18·35	14,291	714·55	4,554·85	667·90	33·40	214·55	4·67
/Xx	19·32	16·35	10,036¼	519·48	4,220·51	487·38	25·23	220·00	4·86
/Yy	11·87	9·87	6,365½	536·26	4,020·92	341·70	28·79	204·30	5·37
/Aaa	18·39	14·97	11,157½	606·71	4,506·66	512·68	27·88	222·01	4·60
/Bbb	17	7·68	4,385	257·94	3,105·36	221·17	13·01	156·10	5·04
/Ddd	28	17·87	16,059	573·53	7,466·31	672·70	24·03	308·87	4·19
/Eee	25	23·58	16,388	655·52	6,224·42	751·52	30·06	280·16	4·59
/Fff	9	1·55	1,128	125·33	3,041·78	56·52	6·28	140·75	5·01
/Ggg	9	7·35	2,880½	320·06	4,307·05	134·46	14·94	202·51	4·67
/Hhh	18·32	12·90	7,573¼	413·39	5,501·04	318·90	17·41	222·57	4·21
/Iii	17·26	14	6,158	356·77	1,655·12	358·19	20·75	97·19	5·82
/Jjj	26	24·48	18,198	699·92	2,854·76	1,016·92	39·11	149·55	5·59
/Kkk	19·19	18·77	8,374½	436·40	1,923·19	393·10	20·48	88·03	4·60
/Aa	21	18·35	9,930½	472·88	1,640·16	460·41	21·92	75·08	4·64
eans	23·59	18·94	13,331·98	565·19	4,915·79	656·28	27·82	237·94	4·92

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JULY, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.		Average Test.
			Per Herd during July.	Per Co during July.	Per Herd during July.	Per Cow during July.	
			Lbs.	Lbs.	Lbs.	Lbs.	%
7/H	9	8·23	4,783½	531·50	252·55	28·06	5·28
7/P	27·84	21	14,469	519·72	724·59	26·03	5·01
7/Tt	17	13·71	10,755	632·65	468·78	27·58	4·36
7/Bbb	80·42	63·03	40,251¼	500·51	1,810·51	22·51	4·50
7/Ddd	11·71	10·10	8,704	743·29	405·49	34·63	4·66
7/Eee	12·90	12·06	8,068	625·42	398·80	30·91	4·94
7/Ggg	13	9·61	5,208	400·61	245·81	18·91	4·72
7/Hhh	12	4·81	2,659½	221·62	96·74	8·06	3·64
7 Iii..................	17·48	8·06	6,459½	369·53	229·22	18·11	3·55
7/Kkk	24·61	17·87	10,207½	414·77	516·74	21·00	5·06
7/Mmm	12	10·85	5,521½	460·12	312·70	26·06	5·66
7/Nnn	16·55	15·26	11,559	698·43	513·02	31·00	4·44
7/Ooo	21	16·10	9,632½	458·69	425·77	20·27	4·42
7/Ppp	19	18	9,734	512·32	505·04	26·58	5·19
7/Qqq	19·29	14	11,390½	590·48	540·49	28·02	4·75
7/Rrr	18·94	12·10	6,412	338·54	271·54	14·34	4·23
7/Sss	10·23	9·10	6,427	628·21	284·00	27·76	4·42
7/Ttt	8	7	4,665½	583·18	200·23	25·03	4·29
Means	19·50	15·02	9,828·19	504·05	455·67	23·37	4·64



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POWER KEROSENE

The Commonwealth Oil Refineries Limited. (Commonwealth Government & Anglo-Persian Oil Co. Ltd.)

DEPARTMENT OF AGRICULTURE.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

LEADING SCORES TO WEEK ENDED 25*th AUGUST,* 1935.—
FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
E. McKee	97	29
E. McKee	97	27
H. C. Stacy	97	36
F. J. Buck	97	219
G. Joyce	97	290
Trios—		
E. McKee	269	28–30
E. McKee	246	25–27
W. H. A. Hodgson	239	298–300
Teams—		
E. McKee	515	25–30
W. Sickert	443	169–174
C. R. Wharton	435	127–132

Class No. 2.—*Any other Light Breed.*

	Eggs Laid.	Bird Nos.
Singles—		
A. Heaysman (Cuckoo Leghorn)	87	323
Langmaid and Bettison (Black Minorca)	71	321

Class No. 3.—*Black Orpingtons.*

	Eggs Laid.	Bird Nos.
Singles—		
A. G. Dawes	86	327
K. Pennack	85	337
K. Pennack	79	340
Trios—		
H. J. Mills	182	331–333
K. Pennack	175	337–339
K. Pennack	169	340–342
Teams—		
K. Pennack	344	337–342
H. J. Mills	300	331–336
A. G. Dawes	285	325–330

Class No. 4.—*Any other Heavy Breed.*

	Eggs Laid.	Bird Nos.
Singles—		
H. J. Mills (Rhode Island Red)	109	364
V. F. Gameau (Rhode Island Red)	85	381
V. F. Gameau (Rhode Island Red)	84	380
Trios—		
K. Pennack (Barnevelder)	212	388–390
V. F. Gameau (Rhode Island Red)	190	379–381
H. J. Mills (Rhode Island Reds (2 birds only competing)	183	364–366
Teams—		
K. Pennack (Barnevelder)	349	385–390
V. F. Gameau (Rhode Island Reds)	330	379–384
A. G. Dawes (Rhode Island Reds)	271	367–372

SECTION 2.—DRY MASH.

Class No. 5.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
G. R. Cowell	75	391
A. J. Monkhouse	66	402
G. R. Cowell	64	396
Trios—		
A. J. Monkhouse	155	400–402
A. J. Monkhouse	152	397–399
Teams—		
A. J. Monkhouse	307	397–402
G. R. Cowell	244	403–408

Class No. 7.—Black Orpingtons.

Singles—		
W. R. Christie	63	409

Class No. 8.—Any other Heavy Breed.

W. R. Christie	58	414

SECTION 3.—WET MASH.

Singles—		
Olive Pitman, Gilles Plains (Black Orpington)	90	439
Lyol Stone, Morphett Vale (Black Orpington)	88	443
Eric Pratt, Abattoirs (White Leghorn)	88	434
Malcolm Booth, Bridgewater (Black Orpington)	87	445
Herbert Oliver, McLaren Vale, Black Orpington)	86	442

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR Summer, 1936.

ECGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

BLACK ORPINGTONS.

EGGS.—10/- per Setting of 15 Eggs. Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—17/6 per dozen; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

Free on Rail, Salisbury.

**DELIVERY.—CHICKS—January to March.
EGGS—January to February.**

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive to 25th Aug., 1935.	Totals
B. Cooke, Kanmantoo.	1	60	
	2	49	
	3	58	167
	4	66	
	5	79	
	6	83	228
			395
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	75	
	14	—	
	15	91	166
	16	83	
	17	67	
	18	49	199
			365
H. F. Muirson, Yundi.	19	5	
	20	46	
	21	38	89
	22	49	
	23	78	
	24	58	185
			274
E. McKee, 5, Rose Street, Carrondown.	25	58	
	26	91	
	27	97	246
	28	94	
	29	97	
	30	78	269
			515
H. C. Stacy, Meadows.	31	38	
	32	74	
	33	94	206
	34	40	
	35	69	
	36	97	206
			412
T. Cleaver, Bridgewater.	37	16	
	38	35	
	39	55	106
	40	75	
	41	29	
	42	48	152
			258
C. Sandstrom, Yundi.	43	57	
	44	—	
	45	53	110
	46	37	
	47	40	
	48	85	162
			272
A. J. Monkhouse, Woodside.	49	49	
	50	88	
	51	68	205
	52	86	
	53	35	
	54	56	177
			382
J. F. Smith, Meadows.	55	53	
	56	70	
	57	7	130
	58	31	
	59	2	
	60	81	114
			244
A. Young, Bridgewater.	61	78	
	62	63	
	63	60	201
	64	29	
	65	79	
	66	57	165
			366
R. W. McAlister, Yundi.	67	47	
	68	53	
	69	74	174
	70	33	
	71	26	
	72	55	114
			288
T. Duhring, Mallala.	73	84	
	74	74	
	75	38	196
	76	42	
	77	63	
	78	68	173
			369
R. J. Underdown, Meadows.	79	39	
	80	40	
	81	82	161
	82	51	
	83	58	
	84	75	184
			345
S. Hill, Bridgewater.	85	38	
	86	77	
	87	70	185
	88	72	
	89	81	
	90	60	213
			398
W. R. Hedger, Yundi.	91	30	
	92	42	
	93	45	117
	94	50	
	95	24	
	96	47	121
			238

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 25th Aug., 1935.		Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 25th Aug., 1935.	
Langmaid & Bettison, Salisbury.	97	29		B. R. Whittington, Yundi.	151	84	
	98	43			152	22	
	99	30	102		153	44	148
	100	69			154	70	
	101	29			155	68	
	102	—	98		156	36	174
			200				322
E. Portlock, Meadows.	103	89		B. C. Sanders, Meadows.	157	71	
	104	64			158	80	
	105	67	220		159	80	231
	106	54			160	68	
	107	43			161	9	
	108	76	173		162	dead	77
			393				308
Murray Powell, Jupiter Creek.	109	87		H. H Gallagher, Pooraka.	163	16	
	110	11			164	51	
	111	68	166		165	58	125
	112	44			166	36	
	113	94			167	21	
	114	35	174		168	65	122
			340				247
G. W. Bignell, Meadows.	115	73		W. Sickert, Meadows.	169	87	
	116	48			170	49	
	117	42	163		171	80	116
	118	46			172	57	
	119	72			173	82	
	120	74	192		174	88	227
			355				443
W. M. Field, Yundi.	121	61		W. Restall, Echunga.	175	16	
	122	22			176	—	
	123	44	127		177	36	52
	124	20			178	66	
	125	55			179	53	
	126	76	151		180	74	193
			278				245
C. R. Wharton, Meadows.	127	61		A. G. Dawes, 230, Portrush Road, Glenunga.	181	75	
	128	71			182	51	
	129	79	211		183	44	170
	130	81			184	22	
	131	68			185	51	
	132	75	224		186	78	151
			435				321
H. H. Hefford, Murray Bridge.	133	54		G. W. Sykes, Yundi.	187	68	
	134	81			188	29	
	135	59	194		189	24	121
	136	29			190	38	
	137	84			191	37	
	138	53	166		192	71	146
			360				267
F. W. Gage, Meadows.	139	52		R. Bartley, Meadows.	193	53	
	140	2			194	86	
	141	dead	54		195	70	209
	142	68			196	45	
	143	36			197	58	
	144	41	145		198	73	176
			199				385
W. H. L. Norman, Echunga.	145	72		A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	44	
	146	43			200	46	
	147	—	115		201	55	145
	148	85			202	67	
	149	53			203	32	
	150	29	167		204	42	141
			282				286

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 25th Aug., 1935.	
J. J. Devlin, Meadows.	205	68	
	206	60	
	207	91	219
	208	63	
	209	36	
	210	85	184
			403
D. J. Foxwell, Echunga.	211	79	
	212	38	
	213	19	136
	214	14	
	215	55	
	216	12	81
			217
F. J. Buck, Meadows.	217	61	
	218	63	
	219	97	221
	220	64	
	221	59	
	222	54	177
			398
J. A. Grist, Yundi.	223	13	
	224	9	
	225	37	59
	226	16	
	227	—	
	228	48	64
			123
L. A. King, Meadows.	229	79	
	230	68	
	231	45	192
	232	—	
	233	60	
	234	3	63
			255
R. W. Sando, Echunga.	235	68	
	236	54	
	237	54	176
	238	61	
	239	54	
	240	35	150
			326
E. W. Young, Meadows.	241	79	
	242	63	
	243	56	198
	244	61	
	245	—	
	246	17	78
			276
A. Jarvis, Yundi.	247	65	
	248	36	
	249	32	133
	250	61	
	251	41	
	252	88	190
			323
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12
S. Bridge, Yundi.	259	59	
	260	75	
	261	60	194
	262	33	
	263	58	
	264	44	135
			329
H. G. Egarr, Meadows.	265	66	
	266	64	
	267	25	155
	268	17	
	269	71	
	270	36	124
			279
R. H. Smith, Yundi.	271	67	
	272	31	
	273	59	157
	274	84	
	275	32	
	276	63	179
			336
J. M. Lawson, Meadows.	277	72	
	278	71	
	279	50	193
	280	54	
	281	71	
	282	54	179
			372
J. O. Marshall, Yundi.	283	6	
	284	54	
	285	62	122
	286	78	
	287	68	
	288	43	189
			311
G. Joyce, Meadows.	289	13	
	290	97	
	291	54	164
	292	63	
	293	77	
	294	50	190
			354
J. A. Bradtke, Yongala.	295	9	
	296	—	
	297	53	
		62	
W. H. A. Hodgson, Salisbury.	298	92	
	299	70	
	300	77	
		239	
A. W. McDonald, Gawler.	301	41	
	302	51	
	303	57	
		149	
J. H. Dowling, Glossop.	304	45	
	305	84	
	306	1	
		130	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 25th Aug,. 1935.	
A. P. Urlwin, Balaklava.	307	60	
	308	45	
	309	9	
		114	
L. S. Ekers, Mount Compass.	310	65	
	311	9	
	312	79	
		153	
V. E. Williams, Semaphore Park.	313	71	
	314	76	
	315	73	
		220	
F. P. Munzberg, Tanunda.	316	73	
	317	60	
	318	74	
		207	
Total Class 1		16,375	
Class 2—Any Other Light Breed.			
Langmaid & Bettison, Salisbury. (Black Minorcas)	319	47	
	320	54	
	321	71	
		172	
A. Heaysman, Government Road, Eden Hills. (Cuckoo Leghorns.)	322	53	
	323	87	
	324	36	
		176	
Total Class No. 2		348	
Class No. 3—Black Orpingtons.			
A. G. Dawes, 230, Portrush Road, Glenunga.	325	38	
	326	17	
	327	86	141
	328	50	
	329	42	
	330	52	144
			285
H. J. Mills, 108, Edward Street, Edwardstown.	331	70	
	332	61	
	333	51	182
	334	46	
	335	72	
	336	dead	118
			300
K Pennack, Pooraka.	337	85	
	338	71	
	339	19	175
	340	79	
	341	51	
	342	39	169
			344
H. H. Gallagher, Pooraka.	343	58	
	344	34	
	345	53	145
	346	60	
	347	37	
	348	17	114
			259
B. Cooke, Kanmantoo	349	18	
	350	29	
	351	21	
		68	
H. H. Hefford, Murray Bridge.	352	71	
	353	28	
	354	31	
		130	
J. H. Dowling, Glossop.	355	31	
	356	23	
	357	62	
		116	
L. S. Ekers, Mount Compass.	358	47	
	359	40	
	360	59	
		146	
A. G. Dawes, 230, Portrush Road, Glenunga.	452	15	
	453	43	
	454	46	104
	455	3	
	456	62	
	457	55	120
			224
A. P. Urlwin, Balaklava.	465	41	
	466	59	
	467	50	
		150	
Total Class No. 3		2,022	
Class No. 4.— Any Other Heavy Breed.			
H. J. Mills, 108, Edward Street, Edwardstown. (Rhode Island Reds.)	361	1	
	362	dead	
	363	40	41
	364	109	
	365	74	
	366	dead	183
			224
A. G. Dawes, 280, Portrush Road, Glenunga. (Rhode Island Reds.)	367	46	
	368	48	
	369	31	127
	370	61	
	371	48	
	372	35	144
			271
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens. (Rhode Island Reds.)	373	56	
	374	73	
	375	dead	129
	376	4	
	377	42	
	378	42	88
			217
V. F. Gameau, Findon Road, Woodville. (Rhode Island Reds.)	379	21	
	380	84	
	381	85	190
	382	66	
	383	13	
	384	61	140
			330

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 25th Aug., 1935.	
K. Pennack, Pooraka. (Barnevelders.)	385	52	
	386	49	
	387	36	137
	388	69	
	389	61	
	390	82	212
			349
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	458	3	
	459	43	
	460	74	120
	461	15	
	462	48	
	463	52	115
			235
Total Class No. 4			1,026
SECTION 2.—DRY MASH.			
Class No. 5.—White Leghorns.			
G. R. Cowell, Balhannah.	391	75	
	392	26	
	393	7	108
	394	26	
	395	21	
	396	64	111
			219
A. J. Monkhouse, Woodside.	397	36	
	398	60	
	399	56	152
	400	38	
	401	51	
	402	66	155
			307
G. R. Cowell, Balhannah.	403	58	
	404	48	
	405	32	138
	406	44	
	407	34	
	408	28	106
			244
Total Class No. 5			770
Class No. 7.—Black Orpingtons.			
W. R. Christie, Upper Mitcham.	409	63	
	410	26	
	411	46	
		135	
Total Class No. 7		135	
Class No. 8.—Any Other Heavy Breed.			
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	53	
	413	28	
	414	58	
		139	
Total Class No. 8		139	
SECTION 3.—WET MASH.			
Home Project Utility Section.—Any Breed.			
Peter Western, Ascot Park School. (White Leghorn.)	415	85	
Peter Western, Ascot Park School. (White Leghorn.)	416	81	

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 25th Aug., 1935.
William Sando, Echunga School. (White Leghorn.)	417	60
Douglas Marshall, Yundi School. (White Leghorn.)	418	64
Norman Page, Murray Bridge School. (White Leghorn.)	419	59
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	56
Dean Colwell, Grange School (White Leghorn.)	421	48
Warren Hannaford, Paracombe School. (White Leghorn.)	422	82
W. Horne, Woodville School. (White Leghorn.)	423	76
Owen Robinson, Ascot Park School. (White Leghorn.)	424	81
June Chapman, Woodchester School. (White Leghorn.)	425	39
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	56
Jack O'Sullivan, Morphett Vale School. (White Leghorn.)	427	72
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	35
James Taylor, Morphett Vale School. (White Leghorn.)	429	58
William Gregory, Victor Harbour School. (White Leghorn.)	430	40
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	31
Clifford Burford, Smithfield School. (White Leghorn.)	432	21
Tom Callaghan, Smithfield School. (White Leghorn.)	433	2
Eric Pratt, Abattoirs School. (White Leghorn.)	434	88
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	72
Alan Yelland, Cunliffe School. (Minorca.)	436	49
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	59

EGG LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs Progressive Totals to 25th Aug. 1935.
Clarence King, Tarlee School. (White Leghorn.)	438	21
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	90
Donald Heading, Sturt School. (Black Orpington.)	440	77
Clive Steer, Sturt School. (Black Orpington.)	441	62
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	86
Lvol Stone, Morphett Vale School. (Black Orpington.)	443	88
Ray Candy, Noarlunga School (Black Orpington.)	444	40
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	87
Murray Heneker and Frank Short, Hamley Bridge School (Black Orpington.)	446	61
Peter Boucaut, Seaton Park School. (Rhode Island Red)	447	21
Peter Preece, Gilles Plains School. (Rhode Island Red)	448	52
Cliff Crosser Wellington Road School. (White Leghorn.)	449	84
John Keldoulis, Orroroo School. (Black Orpington)	450	63
Bruce Dooland Thebarton School. (Black Orpington.)	451	31
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	15
Total		2,192

Diabolo Separator Coy (S.A.) Ltd.

117-119 CURRIE STREET,
ADELAIDE.

D

AGRICULTURE IN THE TEMPERATE AND SUB-TROPICAL CLIMATES OF THE SOUTH.

[A Report by the Deputy Director of Agriculture (W. J. Spafford) to His Excellency Sir Winston Dugan, K.C.M.G., C.B., D.S.O., Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia. Mr. Spafford took a brief tour of portions of the principal agricultural countries in the same climatic zones as the settled portions of Australia, in fulfilment of the appointment as Honorary Commissioner, conferred upon him by His Excellency, to inquire into and report upon the Production and Preparation for Marketing of Agricultural Products, including Crops and Livestock in South America, South Africa, and New Zealand.]*

INTRODUCTION.

In the belief that South Australia will climb from the existing depression on its agricultural production the Government desired to know whether the rural primary producers of the country are keeping abreast of the times or whether others competing in the principal markets of the world are outstripping them in production and marketing methods. To ascertain this, and to bring back anything likely to be of help to local producers, a very brief tour was undertaken in the principal agricultural countries located in the same climatic zones as the settled portions of Australia, viz., those portions of the countries in the Southern Hemisphere where the climatic conditions are either Temperate or Sub-tropical.

To fulfil the objects in view the tour was designed to embrace portions of New Zealand, Chile, Argentina, Uruguay, Southern Brazil, and South Africa, and occupied from mid-November, 1934, to mid-June, 1935, and the following notes are a record of the agricultural conditions, industries, and practices noticed and investigated in the various countries visited.

NEW ZEALAND.

On arrival in New Zealand the Government immediately made arrangements for the local Department of Agriculture to further the investigation of the agriculture of the Dominion, and the officers of the department were unremitting in their attention, and their kindness enabled a considerable amount to be seen in the limited time available.

NEW ZEALAND—A GARDEN.

This wonderful little country of New Zealand is world-famed for its agricultural production, the quantities being extremely high for the size of the country, and the relatively small population. There appears to be no crop suitable for temperate climate which cannot be grown well in some part or other of the islands, and the profusion of the growth of most crops, the evergreen nature of the pastures, and the luxuriance of the trees, justify the description so often applied that "New Zealand is one of the gardens of the world."

The profusion of growth so usual in the country is by no means wholly due to the advantageous natural conditions which exist, but is in great part aided by the skill of the agriculturists and the efficient Agricultural Department which directs its rural activities. The various primary rural products now produced in large quantities are of very high quality, and the portion exported overseas is of the best, is well prepared to suit the tastes of the consumers, and is adequately advertised in the world's markets.

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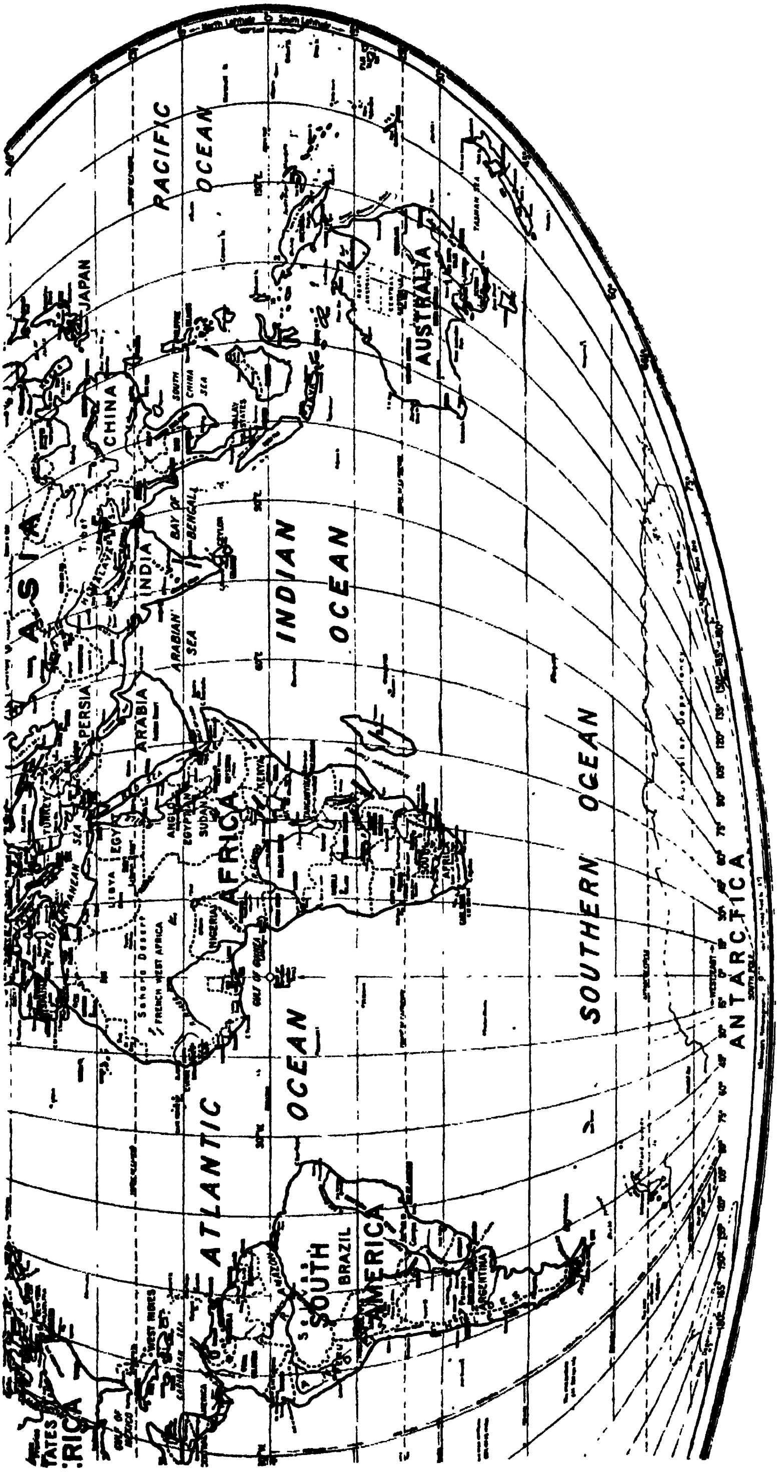
* Tour made in the company of Col. C. P. Butler ("Yattalunga," of the *Advertiser* and the *Chronicle.*)



Australia's Immediate Competitors are located in the Same Climatic Zone in the Southern Hemisphere.

AGRICULTURAL PRODUCTION AND EXPORTS OF NEW ZEALAND.

The agricultural products of New Zealand, of which there are large exportable surpluses, consist almost solely of livestock productions, although the export of apples is appreciable and the sales overseas for small agricultural seeds are expanding rapidly.

In the following table are to be seen the numbers of farm livestock maintained and the slaughterings for home consumption and export:—

FARM LIVESTOCK IN NEW ZEALAND IN 1933-34

Livestock.	Present in 1934.	Slaughterings, 1933-34.	
		Home Consumption	Export.
	No.	Carcasses.	Carcasses.
Sheep	28,649,038	1,652,171	10,729,385
Cattle	4,301,128	329,171	159,233
Pigs	660,393	421,307	378,760
Horses	273,906	—	—
*Fowls	3,308,384	—	—
*Ducks	352,030	—	—
*Turkeys	76,852	—	—
*Geese	43,879	—	—

* 1926 census.

Besides the export of meat New Zealand has developed a strong trade in dairy products and other articles derived from livestock, the principal ones of which are set out in the next table:—

PRINCIPAL LIVESTOCK PRODUCTS EXPORTED FROM NEW ZEALAND.

Article.	1932 33.	1933 34.
	Tons.	Tons.
Lamb (frozen)	136,685	127,445
Mutton (frozen)	54,085	45,331
*Beef (frozen)	33,719	46,692
Pork (frozen)	10,014	19,851
Preserved meat	1,647	1,946
Butter	121,512	141,294
Cheese	95,958	99,612
Casein .:	2,266	2,737
Dried milk	8,887	6,713
Preserved milk	992	961
Wool	143,348	144,330
Sheepskins (woolled)	1,242	1,610
Sheepskins (without wool)	5,701	4,175
Hides	474	682

*To 30th June, 1934, chilled beef to the extent of 16,112 quarters had been shipped to Great Britain.

Although not very considerable yet, New Zealand is in the export field with some crops, and several of these can be increased as markets are found for the surplus. The quantities of the principal items exported last year are set out below:—

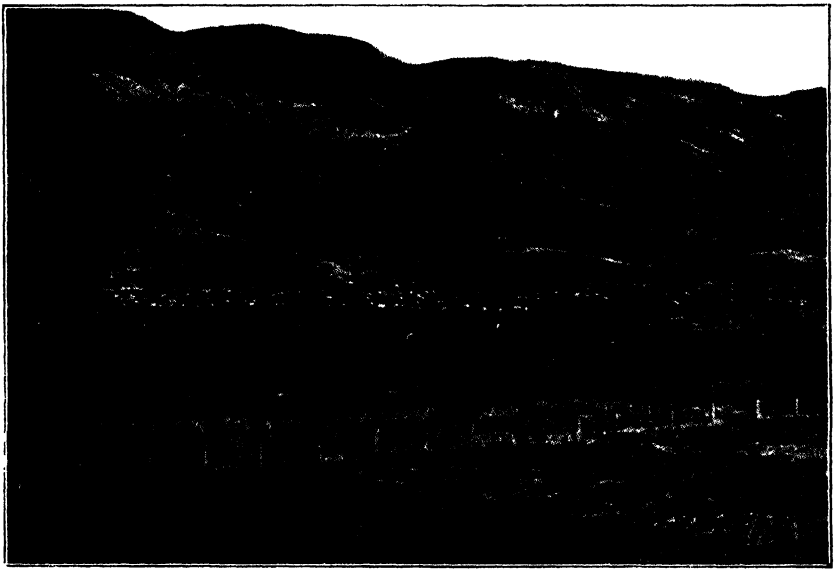
AGRICULTURAL PRODUCTION IN NEW ZEALAND.—PRINCIPAL CROPS IN 1933-34.

Crop.	Area.	Season 1933-34.	
		Production.	Export.
	Acres.	Tons.	Tons.
Agricultural seeds ..	92,158	9,237	3,877
Potatoes	25,028	131,045	3,256
Wheat	286,271	242,036	8,042
Peas	30,362	18,704	816
Oats	78,343	57,903	8
Apples	—	42,411	26,014
Hops	—	—	137

AGRICULTURAL CONDITIONS OF NEW ZEALAND.

The natural conditions of New Zealand are very favourable from an agricultural point of view, and largely because most of the soils are very fertile, although they vary in type a good deal, and nearly all of the country is blessed with a good-enough climate to encourage the growth of plants. In a general sort of way New Zealand is a long narrow strip of land, broken though it be into several islands, stuck out in the Southern Ocean, and as it is a hilly country, it gets the benefit of its position so far south in the rainfall it receives, and because of its narrowness most of it experiences the equableness of climate which usually results from proximity to the sea.

The total area of New Zealand, including all islands and islets, is 104,015 square miles, but the bulk of this area consists of South Island with 58,092 square miles and North Island with 44,281 square miles.



[Photo. from *New Zealand Farmer.*

The Natural Conditions Promoting Growth are so good in most parts of New Zealand that Pasture Plants grow strongly on the Hills as well as on the Plains.

The rainfall of most of the country is relatively high and well distributed, but there are a few small localities where the average annual rainfall is quite low, due to high hills intercepting the rain coming with the prevailing winds. The lowest recorded average annual rainfall is about 13 inches at Galloway, and the highest over 200 inches in parts of the mountains in the south. Much of the country receives from 30 to 50 inches of average annual rainfall, but just as important, particularly where pastures are concerned, is the fact that in most places this rain is so evenly distributed that about equal amounts are received every month in the year. Another favourable feature of the New Zealand climate is that, despite the high rainfall received over most districts, it is neither a cloudy nor a foggy country, but receives plenty of sunshine, and in this direction also favours the development and health of livestock.

Although some of the mountains are snow-capped and frequent falls occur in the ranges, it is very seldom that snow reaches the lower lands, and the climate is so equable that it is quite unnecessary to house farm livestock at any time of the year.

PASTURES OF NEW ZEALAND.

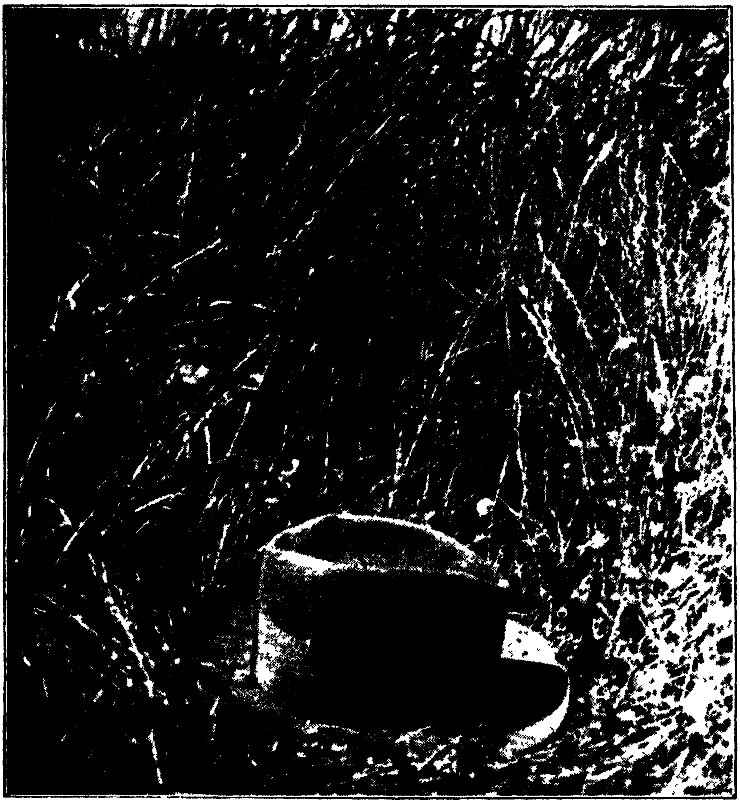
Although many of its agricultural activities are highly developed, there are none more so than the pastures, and all parts of New Zealand, with the exception of the poor "pumice" soils and stony high lands, grow good pastures as soon as the natural tree and bush growth is removed. Where topdressing is applied the growth is usually improved to a very great extent, but there are some localities where manurial dressings have not proved to be economic because the natural fertility of the soils is too high. Even the "pumice" soils, which four or five years ago were looked upon as being too poor to be worth clearing, can be brought very quickly to the stage of carrying two cows in milk to 3 acres by seeding down and the liberal use of phosphatic fertilisers.

The pastures, which are probably the best in the world, are so good throughout most of the year that it is unusual to see extensive reserves of hay and ensilage anywhere except in the dairying districts, and even there most farmers appear to depend upon the pastures without storing much fodder for future use. In the better districts, and for that matter practically everywhere away from the hills, the pastures are to all intents and purposes evergreen, and there is little need to think of storing fodder.

A Pure Stand of White Clover in New Zealand. The Pastures of New Zealand are probably the best in the world, and consist almost wholly of mixtures of grasses and clovers. If preference can be given to any particular plant it would be allotted to White Clover as the most important pasture plant for New Zealand conditions.

The livestock-carrying capacity of the better parts of New Zealand is so very high that it is difficult to believe the figures supplied, but they are confirmed by so many farmers and departmental officers as well that visitors cannot help but be convinced, despite preconceived ideas of possibilities in this direction. A few instances in this connection, amply supported by outsiders, will give some idea of how wonderful are the pastures of widely separated districts in New Zealand:—

(*a*) At Pakowhai, near Hastings, on Hawke's Bay Plains, a farmer on 369 acres carried, in 1933, 2,300 crossbred ewes for the whole year, lambed them down, fattened and sold 115 per cent. of lambs, then fattened 6,000 sheep, on which he made 3s. 6d. per head, and during the year fattened 100 bullocks as well. Besides all this grazing, 97 acres were left for seed, and from the area 26bush. of double-dressed Rye Grass seed and 120lbs. double-dressed White Clover seed were harvested per acre. The one-year-old stand of Rye Grass to be harvested this season (1934-35) is expected to yield 45bush. per acre of "maiden" seed. The only cropping done by this farmer is the growing of a few acres of Mangels each year, from which yields of 80 to 100 tons per acre are secured. After the crop of Mangels the land is seeded with a mixture of 2½bush. Rye Grass seed and 1½lbs. White Clover per acre. The only fertiliser used consists of 5cwts. "Bone and Blood" per acre with the crop of Mangels, but such a small area is sown to this crop each year that very little fertiliser is given to the land, and then only occasionally. The seeding mixture used by this farmer is not the one commonly seeded in districts other than Hawke's Bay, for in most places it is more like 1bush. of Grass seed and 3lbs. White Clover per acre.



A 30 year-old Pasture of White Clover and Perennial Rye Grass in Zealand shut up for seed. When intelligently managed some of the pastures remain good for many years, and then produce the most valuable seed.

(*b*) On a property of 1,700 acres, also located on Hawke's Bay Plains, near Hastings, 150 acres were harvested for seed in 1933, and throughout the year the farm carried 8,000 crossbred ewes (which were lambed down, and the lambs sold to a freezing works), about 3,000 "dry" sheep and 300 bullocks. After the lambs were sold some thousands of sheep from the hilly country owned by this farmer were fattened and sold for slaughtering.

(*c*) On a 100-acre farm some few miles to the north of Palmerston North, and by no means possessed of rich-looking soils similar to those of Hawke's Bay Plains, the farmer carried 900 breeding ewes all through 1933 and fattened 120 per cent. of lambs, without purchasing any foodstuffs. The holding is subdivided into 7-acre fields or thereabouts, each with its water supply, and the sheep are kept in each field for only one day at a time. In the winter all of the ewes are in one flock, but in the spring and summer three flocks of about equal size are maintained. In winter the fields are fed for one day and spelled for 13 days, but when the flock is subdivided the spelling of fields is reduced to about 4 days after a 1-day grazing. One field—about 7 acres—was cut for hay, for the use of stock other than sheep, and to make certain that the sheep would not be short of feed in winter.

Four hundredweights per acre of a proprietary mixed fertiliser are applied as a topdressing every year.

(*d*) At Henderson about 11 miles out of Auckland, a 60-acre farm (including extensive buildings) maintains 45 Herd Book Jersey cows, and all calves, heifers, and bulls are reared, and the calves are the only animals receiving any purchased foodstuffs of any kind. About 600 pigs are kept on this farm all of the time, the yearly sales being about 2,000 animals, and a great deal of greenstuff is cut for these pigs. The pastures are kept in full growth by an annual topdressing of 600lbs. superphosphate and ½ ton lime per acre. Both hay and ensilage are made on the property for use in the winter, but no foodstuffs are purchased for the cows.

Plants in the New Zealand Pastures.

The plants in the pasture mixtures and their relative importance vary according to the soils, climate, and steepness of the country, but in a general way it can almost be taken for New Zealand that where pastures are well managed on the plains country they consist of Perennial Rye Grass and White Clover, and on the high land of Danthonia, with White Clover as well in many places. Practically all European pasture plants do so well in this country that all sorts of mixtures exist, but the outstanding pastures seen contained a well-balanced mixture of Perennial Rye Grass, White Clover, and Rough-stalked Meadow Grass (*Poa trivialis*), and some of the bulkiest pastures hold a fairly high proportion of Cocksfoot as well as the other three plants.

The development of good pastures does not appear to be the result of choosing the correct mixture when seeding down, but rather to the management of the pasture so as to keep down the coarser forage plants and to encourage those of finer quality. In neglected fields, and particularly in those which are understocked in the spring and early summer, a wonderful growth of White Clover is usually found, but instead of this being well-balanced with Perennial Rye Grass and *Poa trivialis* there is frequently found a luxuriant mass of Cocksfoot, Prairie Grass, *Poa trivialis*, Red Clover, and some Perennial Rye Grass, all maturing at different times, and in some cases Tall Fescue (*Festuca arundinacea*) again over-runs the fields. Adjoining fields judiciously managed show the perfectly balanced White Clover and Grass pastures which give such heavy grazing results, and when desired produce heavy crops of clean seed of good quality. It is found that correct balance can only be maintained by regularly and frequently grazing these pastures fairly hard, and again getting livestock on to them before the plants have become coarse and thick.

It is quite impossible to form a correct idea of the relative importance of the principal pasture plants being grown, during a visit of short duration to an extensive agricultural country, but considering how frequently they are seen, White Clover, Perennial Rye Grass, Cocksfoot, Rough-stalked Meadow Grass, and

Red Clover are of outstanding importance on the very fertile plain lands; Danthonia and White Clover suit the high lands; and White Clover, Cocksfoot, and Perennial Rye Grass are of the utmost value on the lands being reclaimed from the scrub.

It is impressive to see the wild and luxuriant growth of pasture plants along practically all roadsides of New Zealand, and in every vacant block of land in the towns. This tangled mass of growth consists, as a rule, of Cocksfoot, Tall Fescue, and Prairie Grass, 5ft. or more in height, Perennial Rye Grass about 3ft. 6in. high, Red Clover nearly as high, and the sole usually consists of White Clover, but sometimes includes Rough-stalked Meadow Grass or Kentucky Blue Grass. Although useless weeds are sometimes fairly plentiful, they are more often than not present in relatively small patches, or as scattered plants.

Roadside Growth of Pasture Plants in New Zealand, in which Cocksfoot and Tall Fescue are prominent It is of common occurrence in townships in New Zealand to see strong growth of pasture plants along the roadsides, on vacant blocks, and in odd corners.

When some of the wetter lands are cleared, and when some of the richer pasture lands are neglected, Tall Fescue tends to take possession of the land, and makes dense, rank growth to the almost total exclusion of other pasture plants. Although this grass has some grazing value, it is not looked upon with favour, and the first step towards improvement of such pasture is the eradication of the Tall Fescue.

Temporary Pastures in New Zealand.

Where temporary pastures are desired it has become general to sow a simple mixture of Italian Rye Grass and Red Clover, using up to 25lbs. per acre of the former and 5 or 6lbs. per acre of Clover. Such a mixture supplies a lot of grazing, can then be cut for hay or ensilage, and recovers quickly to provide further grazings.

Grazing New Zealand Pastures.

Rotational grazing is generally practised by most of the progressive livestock farmers of New Zealand, even to the extent of leaving the animals on the pastures for one day only at a time. This does not appear to be done with any idea of getting more proteinous forage, but rather to prevent the fouling of the pastures, and to reduce the risk of eating-out the better-quality fodder plants. There is no need to look for more protein in these conditions, because White Clover is so plentiful in practically all grazed pastures. Regularly feeding the pastures down really short, and never allowing them to reach a rank stage, is essential to maintain luxuriant-growing pastures in good condition.

Other Treatments of New Zealand Pastures.

In many agricultural countries it is usual to regularly harrow pastures, but this practice does not appear to be very popular in New Zealand, and there seems to be a tendency to discontinue the use of implements which tear up the sod to any marked extent, and to use only something which will efficiently spread the droppings of animals without disturbing the roots of the pasture plants.

In most places care is shown in the removal of bad weeds from the pastures, and most New Zealand fields are remarkably free from really troublesome plants. Some farms were seen where attention to these pests was needed, and in a few instances bad weeds were very plentiful, but of the parts of New Zealand visited, these cases were exceptional and very far from the rule.

A properly managed Pasture in New Zealand, where the feed is kept grazed very close throughout the year It has long been realised in New Zealand that pastures must never be allowed to become rank if full returns and long life are to be attained

Except in the very best pasture-growing districts of New Zealand topdressing is usual, superphosphate being the fertiliser most generally applied, although quite a lot of lime is also being put on to the land. Dressings of 3 to 6cwts. of superphosphate per acre per year are not unusual, and 5 to 10cwts. of lime per acre are being added, in some cases every year, but more often every second year.

PRODUCTION OF HIGH-CLASS AGRICULTURAL SEEDS IN NEW ZEALAND.

At Palmerston North Pure Seeds Research Station very extensive and complete work is undertaken in connection with the standardisation, improvement, and multiplication of the seeds of most of the important agricultural crops grown in New Zealand, with the notable exception of wheat, work with which is undertaken at Lincoln Agricultural College. Besides research work, test plots of all pastures, for which applications for certification have been received, are sown down in comparison with standard check plots. Quite a lot of work is being done with Lucerne, Garden Peas, Rape, Mangels, &c., but the outstanding activities of the institution have to do with pasture plants, and particularly with White Clover and Perennial Rye Grass, and to a lesser extent, although still considerable; with Cocksfoot and Montgomery Red Clover.

A high degree of success has already been attained with the improvement and standardisation of both White Clover and Perennial Rye Grass, so much so that sufficient seed for about 30 acres of each will be harvested this year from plots of vastly improved strains of both of these very important pasture plants. This seed is to be sown in several districts in New Zealand under the close supervision of officers of the Department of Agriculture, with the intention of making this season's distribution the starting point for certification of seeds, and in the near future all seed of Perennial Rye Grass and White Clover certified by the Department of Agriculture will have been derived from this seed. These strains will remain the basis of the source of seed for New Zealand until better ones are developed at the Station, when the process of multiplication and distribution will be repeated.

In connection with the certification of seeds, samples are collected by an officer of the Department of Agriculture from all fields for which applications for testing for certification have been made, and are grown in small plots alongside of standard check plots, and unless those being tested come up to one or other standard, certificates are refused.

Details of this seed certification scheme, which is doing so much to improve the pastures of New Zealand, have been published in the *Journal of Agriculture* of New Zealand.

Besides conducting the necessary selection work in connection with the production of first-class seeds the Department of Agriculture does everything it can to encourage farmers to produce the very best seeds, and as a consequence New Zealand has developed a good name for small agricultural seeds. District Agricultural Instructors visit growers frequently, advising how close to feed pastures, when to remove livestock, when to harvest, &c., and, when possible, trace the origin of the seed from which good stands have been derived, when it seems at all likely that they can be brought into the certification scheme, even though application was not made in the year of establishment.

Producers of seeds strongly support the Department of Agriculture in its pure-seed activities, and farmers are so convinced of the advantages accruing from the use of certified seed that the demand is so brisk that all seed is absorbed and at so high a price that seed-growers are fully recompensed for any extra trouble and expense they may be put to.

The pastures of New Zealand have improved to a considerable extent since the inauguration of the Seeds Certification Scheme, and it is generally recognised that the improvement is likely to be progressively greater as time goes on, and that the development of this scheme has been one of the outstanding successes of the Department of Agriculture, and is of the utmost economic value to the Dominion.

SHEEP IN NEW ZEALAND.

Although New Zealand maintains about 29,000,000 sheep, which produce about 270,000,000lbs. of wool annually, she cannot be looked upon as a serious competitor with Australia for wool. The climatic conditions obtaining in much of the Dominion are such that the British breeds of sheep, or at all events some kind stronger and more robust than the Merino, must be kept, and so large quantities of "fine" wool similar to that cut from the Merinos, which do so well in Australia, cannot be expected. Not only does a large proportion of New Zealand receive heavy annual rainfall, but it is so well distributed throughout the year that the pastures are practically evergreen, and footrot is so prevalent amongst sheep that it is essential to use animals of the Romney Marsh breed in many parts of the country, and advantageous in most. The trouble is so serious in some places that even the Romney Marsh sheep, with their very high resistance to the disease, suffer a lot of damage.

Because of the conditions that obtain, New Zealand has become a very important producer of mutton and lamb, and has exploited the export markets so thoroughly that she holds pride of place both for quantity and quality. Of recent years about 8,000,000 carcasses of lamb and about 2,000,000 carcasses of mutton have been exported annually, and are so well bred, properly fattened, carefully slaughtered and shipped, and so judiciously advertised that they have commanded prices above those received for carcasses exported from other countries to the same markets.

New Zealand is admirably suited for the type of sheep-farming now being practised, because the Dominion has so much good fattening country that the great bulk of the lambs reared can be fattened whilst still on their mothers, and there is ample pasturage remaining to fatten the lambs reared on poorer pastures, and also to fatten the millions of mature sheep which are used for home consumption and for export overseas.

With the further development of the pastures of the sheep farming districts a considerable increase in the number of sheep maintained must follow, and on present appearances it seems as though the development will be along lines similar to those now being followed, and that in the near future an improvement will be made in the wool being produced by long woolled sheep rather than by replacing the present type of sheep with other breeds carrying better quality wool. It is quite possible that the improvement in wool quality will be brought about much sooner than is generally anticipated, because the recently perfected Benzol Test for Hairiness in Wool, as developed by Professor Peren, the Principal of Massey Agricultural College, and some members of his staff, promises to lead to the rapid elimination from the Long-wool Studs of all animals likely to breed progeny containing hair in the fleeces, a defect quite common now. The test has only been in operation a short while, and although a charge of 1s. per ewe, and 3s. per ram is made, studmasters are very interested in it, and at the present time over 5,000 stud sheep are having their fleeces tested at Massey College.

[Photo. from *New Zealand Farmer.*

First Prize Pen of Fat Lambs in the 1934 North Canterbury Competition All pens of lambs entered in this important competition were sired by Southdown rams, although the dams of the lambs varied as to breeding

New Zealand Fat Lambs.

It is an educational treat for any agriculturist interested in the production of meat for export to visit a Slaughtering and Freezing Works in New Zealand during the lamb-killing season, for then can be seen thousands of lambs of almost identical length, conformation, colour, and weight. This is rendered possible, partly because of the enormous numbers of lambs produced, but largely because most of the lambs are bred on similar lines, and fattened on similar types of pasture. The vast majority of the lambs are sired by Southdown rams, and are out of pure-bred Romney Marsh ewes or crossbred ewes containing a lot of Romney Marsh blood. It was such breeding that the famous Canterbury lambs possessed, and on which their reputation was built, and these lines have been followed to such an extent in New Zealand that all of the best quality lambs produced in the country are now known as Canterbury Lamb. As a matter of fact, of recent years lambs from several places in the North Island have been of better quality than those produced on the Canterbury Plains, and they were in most cases out of Romney Marsh ewes by Southdown rams. The ewes in the North Island are almost wholly of the Romney Marsh breed, and other than those mated to Romney Marsh rams to keep up the flocks, most of them are mated to Southdown rams for the production of fat lambs. It is generally stated that the South Island lambs have not deteriorated, but those bred farther north have been improved to a greater extent, but on the other hand it has been suggested, and not without reason, that

[Photo from *New Zealand Farmer*.

The Carcasses of the Winning Pen of Fat Lambs in the 1934 North Canterbury Competition.

there has been deterioration, and that it has been brought about because of the fact that good deep-bodied pure-bred and three-quarter-bred long-woolled ewes, which were general at one time, have been replaced by Merinos and small, culled crossbred ewes from sheep stations in other districts. The practice has developed of fattening the mothers of the fat lambs soon after the lambs are sold, selling them for export, and then buying a fresh lot of ewes. The ewes purchased from poorer country are not nearly so good as were the ewes the farmers bred formerly themselves. The deterioration, if any, cannot be due to the sires, because Southdown rams have always been used, and the quality of these has improved of recent years.

Most of the sheep seen in the top portion of South Island and the North Island up as far as Auckland were of the Romney Marsh breed or crossbred Romney Marsh, with some Southdowns and Corriedales. Most of the ewes are of very good type, with just a few on the rough side, and the majority are usually mated to Southdown rams. On the poorer country the lambs do not fatten too well whilst on their mothers, and these are weaned and sent to the good pastures on the plains to be fattened for market.

Lambs for export overseas are purchased on the farms, the buyers picking the lambs fit for slaughter. It is the general practice for the buyers of lambs to distrust their eyes and actually to handle every lamb purchased. Very seldom are lambs intended for export taken from their mothers before the day they are to be slaughtered, and so they practically always go to the butcher still carrying their natural bloom.

Although most lambs are slaughtered at weaning, about 20 per cent. are only forward stores when taken from their mothers, but as they are weaned on to first-class pastures in better districts they do not take long to fatten, and by all accounts they recover their lost bloom and kill-out really well.

The wonderful pastures of New Zealand ensure the production of high-quality lambs in enormous numbers, and in a way that can never be attained in countries without these advantages. Luxuriant pastures which are green all of the year around are common in New Zealand, and cases were seen in which nine ewes per acre were carried throughout the year; all their lambs were fattened whilst on their mothers, and then nearly 20 sheep per acre and a bullock to 2 acres were fattened in the summer.

Besides the luxuriance of the pastures, another factor ensuring large numbers of lambs is the very high lambing percentages secured on the farms. Anything below 115 per cent. to 120 per cent. of tailed lambs is considered low, and one farmer claimed to have attained a lambing of 146 per cent. for his whole lambing flock in 1934. These high figures are largely due to the fact that pure-bred long-woolled ewes are maintained on many fat-lamb farms as the dams of the lambs, but is also partly due to the high rate of fertility of Southdown rams, and to the care and attention given to the flock at mating time. It has been suggested that the high percentage of lambs secured when Southdown rams are used is not due so much to their exceptional vigour, but to their habit of always looking for fresh ewes and the rarity with which they will serve the same ewe twice, as is common with some other breeds.

NEW ZEALAND MEAT PRODUCERS BOARD.

New Zealand is a very important exporter of meats of all kinds, a position she has held for a considerable time, the growth of these exports being very rapid once the possibilities of landing frozen meat in the United Kingdom in good order were established. The first shipment of frozen meat from the Dominion arrived in London in May, 1882, in the sailing ship *Dunedin*, and consisted of 3,521 frozen sheep, 449 frozen lambs, and 22 frozen pigs, whilst the 1933-34 consignments reached the enormous figures of 1,813,802 carcasses of mutton, 8,671,351 carcasses of lamb, 440,979 carcasses of pork, 371,140 quarters of beef, and 743,573 freight-carcasses of 60lbs. of boneless beef and sundries, or an equivalent of 9,051,062 freight-carcasses of 60lbs. weight.

As this meat-export business was growing into such huge proportions, dissatisfaction with the differences in the prices paid by the consumer and those received by the producer was developing also, and at the same time the increasing competition from other countries meant that the utmost care in preparation for marketing was necessary, and so in 1922 the Government of New Zealand passed an Act for the creation of a Meat Producers Board to control the export of meat.

The Board is composed of two members appointed by Government, five members elected by producers of meat for export, and one member representing stock and station agents, and the first meeting was held on 14th March, 1922.

The Act gave the Board power to make a levy of 2d. per carcass of mutton, lamb, pork, and veal, and 1d. a quarter or 2d. a side for beef; but the rates were fixed by the Board at half of the maximum allowed, and in December, 1930, the levies were reduced by 25 per cent., and during the period have yielded between £29,000 in 1925-26 and £42,100 in 1922-23, with £34,400 collected in 1933-34. Of the income of the Board, 75 per cent. is earmarked for advertising purposes.

The principal functions of the Board are to regulate shipments so that there are no temporary shortages nor gluts on the market, to endeavour to reduce costs between producer and consumer, to present the meat to the purchaser in the best possible condition, to advertise adequately the meat in consuming countries, and to assist producers whenever possible.

As the Board makes all contracts for the carriage of the whole of the meat exported from the Dominion the regulation of shipments was a natural outcome.

Considerable reductions in the costs of handling the meat have been brought about since the Board came into existence, much of which was due to the activities of the Board. Reductions in freight have been made on the 1922 rates of from 40 per cent. to 58 per cent. on various lines, and have meant the following very considerable savings:—

On 60lbs. weight sheep	3s. 8d. per head.
On 35lbs. weight lamb	2s. 0½d. per head.
On 120lbs. weight pig	9s. 2½d. per head.
On 720lbs. weight bullock	40s. per head.
On 500lbs. weight cow (boned) ..	from 38s. 5d. to 43s. 9d. per head.

Reductions have also been made in insurance rates, charges of the Port of London Authority and other British port controls, slaughtering, freezing, and handling charges in New Zealand, and in the cold-storage rates in England. The latter is estimated to save £50,000 per annum.

Everything possible is done to present the meat to purchasers in the best possible condition, and for the purpose carcasses are now carefully graded, multiplicity of marks has been reduced by standardising grade marks, delays, and excessive handling have been lessened because of the reduction in number of parcels which followed the limiting of consignments to 250 or more lambs or sheep, and to superintend loading the Board has appointed inspectors.

The advertising of New Zealand meat in the purchasing countries is one of the outstanding features of the activities of the Board, and has been carried out so efficiently that it is the envy of all other exporting countries. Having available for the purpose £25,800 (75 per cent. of £34,400 levies), which is obtained from the very small levies of ¾d. a carcass of mutton, lamb, pork, and veal, and ⅜d. a quarter of beef, and this after all administration and other expenses are paid, is sufficient justification for the existence of the Board, and judiciously handled must lead to the popularisation and sales of New Zealand meats.

Meat producers in the Dominion are helped by the Board in all sorts of ways, such as the making of grants to (*a*) Low Temperature Research Station at Cambridge; (*b*) the Entomological Department of the Cawthron Institute at Nelson for investigating insect pests of animals and pastures; (*c*) the Plant Research Station at Palmerston North, for combating the ravages of the White Butterfly; (*d*) Canterbury Agricultural College at Lincoln for investigating ewe and lamb mortality; (*e*) Massey Agricultural College for Wool Research; (*f*) Pig-recording Clubs; (*g*) Competitions for Boys and Girls Pig Clubs; and (*h*) Agricultural Shows for Special Prizes. Lectures are arranged in various country centres on Livestock Management, and the Board financed an expedition to South America in search of insects to control the noxious weed "bidi-bidi."

The impression gained from discussing the Meat Producers Board with interested parties is that it is of very great value to the meat industry of New Zealand, and producers are overwhelmingly of the opinion that they could not do nearly as well without its assistance.

BRANDING OF MEAT FOR EXPORT TO GREAT BRITAIN.

As all meat reaching Great Britain after 7th January, 1935, had to be branded or stamped, stencilled, or printed in ink or stain in defined positions on the carcass or joint, it was of interest to see how New Zealand exporters were facing the new regulation, and it was found that the method adopted was not unduly disfiguring the carcasses. By applying a light-brown ink on rubber stamps and using as little pressure as possible an indelible brand was put on the meat which was readable yet not unsightly, and where the following mixture was used to carry the stain the brand became fast a few minutes after application, and would not run even if purposely wetted:—

Water	6 parts by weight.
Methylated Spirits	6 "
Sugar	3 "
Glycerine	1 "
Stain to suit.	

DAIRYING IN NEW ZEALAND.

The dairying industry of New Zealand is of such huge dimensions that considerable time would be necessary to investigate it in any detail, and as this time was not available no effort was made to look into it at all deeply. From a casual look at some of the most productive agricultural districts of the Dominion it appears that dairying is the most important agricultural activity which can be undertaken under present conditions, and if this is so, dairying will probably always be of some account in New Zealand's primary production.

In travelling about the country districts one cannot help being struck by the very high proportion of Jersey cattle—pure bred and grade—seen everywhere, and many of them are really high-class animals. Even more striking, perhaps, is the frequency with which first-class Jersey bulls are seen with the herds, whether they be stud-book or ordinary dairymen's herds. The Department of Agriculture has concentrated in recent years in encouraging the grading-up of crossbred herds and the improving of the better bred herds by the use of high-quality bulls, and as a consequence good bulls are to be seen almost everywhere. The impression gained, after approaching numbers of people on the matter, was that this policy is having a marked effect on production, and that it will continue to do so.

That the growth of the dairying industry has been rapid and has reached very important proportions can easily be realised by a glance at the following table:—

COWS AND BUTTERFAT IN NEW ZEALAND.*

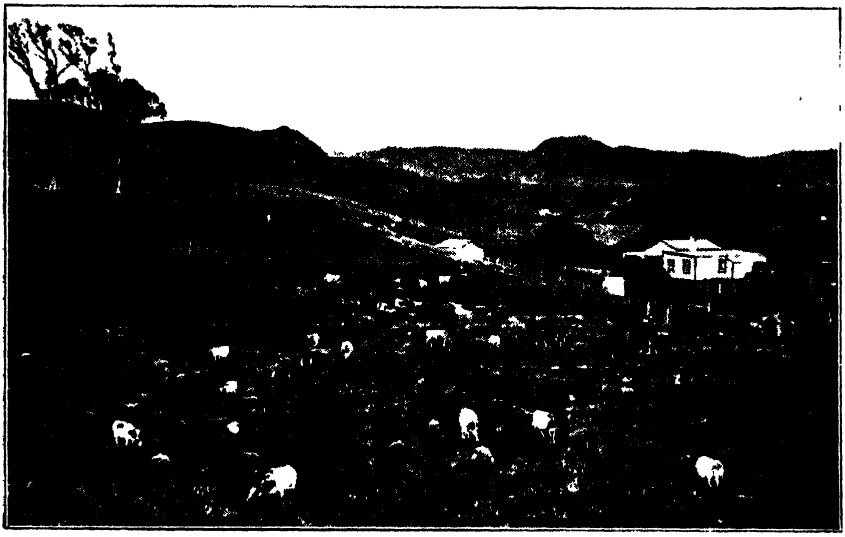
Season.	Cows (in milk and dry).	Butterfat per cow.	Total Butterfat.
		Lbs.	Lbs.
1901-02	381,000	127.20	49,000,000
1911-12	656,000	140.10	92,000,000
1921-22	1,137,000	174.97	199,000,000
1931-32	1,702,000	199.65	340,000,000
1933-34	1,933,000	220.80	427,000,000

* Dairy Industry Commission Report (H. 30 of 1934).

The increase in the industry, as disclosed by the above figures, is really great, and nowhere more than in the production of butterfat per cow, which has been raised for the whole of New Zealand from 127.20lbs. per cow to 220.80lbs. per cow in just over 30 years, and the people closely associated with the industry expect this improvement to continue. The credit for the increased returns per cow is usually recognised as being due to improved pastures, herd-testing, discriminate breeding and culling, and importation of stock.

Most of the land carrying high-producing dairy herds is top-dressed annually, and practically all of the dairying country gets applications of fertiliser now and again. It is estimated that about 5,000,000 acres of New Zealand are devoted to dairying, and although all of this is not top-dressed every year the great bulk of it has had applications of manure during the past three years.

Herd testing is so highly thought of in the Dominion that 287,000 cows were under test in 1933-34, and these averaged 262.44lbs. of butterfat per cow, as against 220.80lbs. per cow for the whole of New Zealand.



[Photo. from *New Zealand Farmer.*

A Dairy Farm in New Zealand. Dairying is the principal agricultural activity of the Dominion. The natural conditions encourage the production of milk, and the regularity and coolness of the climate favour the manufacture of good quality dairy products.

Co-operation Among New Zealand Dairymen.

Supporters of co-operative schemes make the claim that much of the progress made by the dairying industry in New Zealand has been due to the fact that the great bulk of the manufacturing of dairy products is done by co-operative concerns, and whether this is so or not the organisations are certainly an important part of the industry. Of the 140,000 tons of butter exported in 1933-34, all but 8,000 tons were shipped by co-operative companies, and of the 110,000 tons of cheese, proprietary firms only shipped 2,000 tons.

Export of Dairy Products from New Zealand.

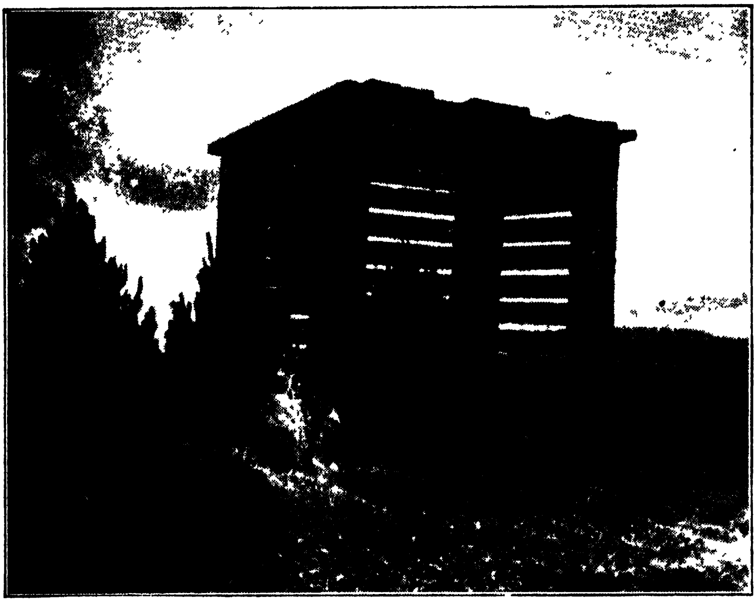
Although New Zealanders as a people eat more butter per head of population than those of any other country, and a lot of cheese as well, still they only consume a small proportion of what is manufactured and leave very large quantities to be exported. Of the 164,163 tons of butter made in 1933-34, nearly 84 per cent. was exported, and of the 106,288 tons of cheese made in the same year 97½ per cent. was sent overseas.

COST OF MANUFACTURING BUTTER AND CHEESE.*

Approximate Total Costs and Charges at per lb. of Butterfat.

Year.	BUTTER. From factory gate to F.O.B. ocean steamer (including cream collection).	CHEESE. From "in factory" to F.O.B. ocean steamer.
	Pence.	Pence.
1925	2.65	4.00
1926	2.63	3.91
1927	2.59	3.68
1928	2.21	3.41
1929	2.06	3.39
1930	2.00	3.20
1931	1.97	3.02
1932	1.95	2.83
1933	1.69	2.62
1934	1.67	2.50

* Dairy Industry Commission Report (H. 30 of 1934).



A louvred roadside shade for Cream and Milk Cans, as frequently seen in New Zealand. Despite the relatively cool climate of the country great care is taken to see that cream and milk reach the factories in good condition.

These figures show very clearly that not only has the total production of dairy produce in New Zealand increased by leaps and bounds, but efficient and up-to-date factory methods have been followed, enabling manufacturers to reduce progressively the costs of production of both butter and cheese. A reduction from 2.65d. to 1.67d. per lb. of butterfat in the making of butter, and from 4.0d. to 2.5d· per lb. of butterfat in the making of cheese in a period of ten years are notable achievements, and must have helped the industry very considerably.

Dairy Farm Instruction.

Besides the activities of the Dairy Branch of the Department of Agriculture a voluntary dairy farm instruction scheme operates in New Zealand and is subsidised by the Government to the extent of paying half of the salary of the instructor. If a dairy factory or group of factories desire an instructor a trained man is provided by the Government, who pays his salary, and the factory or factories refund half of the salary and pay all travelling expenses. The instructor works in association with factory managers and calls on the suppliers of the factories engaging him.

Natural Conditions for Dairying.

In many parts of New Zealand the natural conditions are almost ideal for dairying, and where there is a deficiency it is usually the easily-corrected shortage of phosphorus. The pastures are so luxuriant and constant throughout the year, and the climatic conditions are such that there is no need to close-house the animals, and so the cows are fed almost wholly on pasture. Pastures are generally looked upon as the cheapest of all milk-producing foodstuffs, and certainly have the reputation of giving butter and cheese a better flavour, and of supplying them with more vitamins.

That many of the dairy farms of New Zealand are suitable for the purpose can be seen from the following extracts from the report of the survey made by the Department of Agriculture of dairy farms on which all cows were milked by machines:—

Farms surveyed	550
Total area	68,250 acres
Average area	124 acres
Cows maintained	0.46 per acre
Butter-fat produced	117.73lbs. per acre
Average butter-fat	254lbs. per cow

PIGS IN NEW ZEALAND.

Little opportunity offered during the hurried tour through some of the agricultural districts of New Zealand to inspect many pigs, and of those at killing works and on farms the Tamworth breed predominated. The animals seen, whether pure-bred Tamworths or crossbreds containing a lot of Tamworth blood, were of excellent type, but the relatively few of other breeds seen were not quite of the quality demanded at present.

Under existing conditions it does not appear as though New Zealand will become an important producer of grain, and if this remains so the Dominion will always be handicapped in connection with the production of bacon pigs. There is a very plentiful supply of skim milk, buttermilk, and whey, and so pigs can be reared easily to porker size, but to purchase sufficient grain to continue the animals to bacon size, and then have to ship to markets on the other side of the world, does not at the moment appear to be an attractive economic proposition

Pigs are an important form of livestock for such a dairying country as is New Zealand, despite the limited amount of grain available, and during 1933-34 97,448 breeding sows were maintained in the country, and the slaughterings totalled 766,627 animals.

OTHER AGRICULTURAL PRODUCTS.

New Zealand is an agricultural country which can produce all of the articles usually found in temperate climates, and a few of the productions of the Dominion, other than those already dealt with, have some features of interest to Australians.

Wheat.—Although only a relatively small quantity of wheat is grown in New Zealand, a good deal of research work is being undertaken in connection with the crop. At Lincoln Agricultural College, where the field work connected with the Wheat Research Station is carried out, the collection of wheat plots is probably the greatest being maintained in any part of the British Empire. All field tests laid down are replicated twenty times, and as most of the plots are growing cross-fertilised wheats, the work entailed is enormous. The principal aim of the wheat-research workers is the development of heavy-yielding wheats producing grain of good quality, and Dr. Frankel is confident that a new crossbred wheat, to be distributed this year, is very close to the desired type.

Poultry.—New Zealand is handicapped as far as poultry production is concerned because the Dominion does not produce a surplus of wheat or other grain suitable for large numbers of egg-laying fowls, and so it does not appear to be at all probable that this country will become an important exporter of eggs in the near future. In the beginning of December, 1934, new-laid stamped eggs were being retailed at 10d. to 1s. 1d. per dozen in the principal towns.

Fruit.—The climatic conditions of New Zealand are such that all temperate-climate fruits can be grown in large quantities when economic conditions warrant it, but at present the quantities exported are not very great, with the exception of apples. No effort was made to investigate fruit-growing activities in the Dominion, but it was impossible not to notice that the orchards seen, which were mainly growing apples and in some fewer cases pears, were very well cared for, the trees being large and healthy and the soil well tilled and clean.

Strawberries offered for sale were wonderful, both as to size and colour, whilst the smaller kinds also had good flavour. Some of them were so large that there was only room for nine in the top layer of an ordinary 1lb. punnet,' *i.e.*, three rows of three strawberries. Few punnets showed more than four rows of berries, even of the smaller varieties. Strawberries were being offered at 9d. to 1s. per punnet.

Grapes from California were on sale at 1s. per pound, and were in really good order, and as so many were displayed it seems that there is a fairly ready sale for them even at this price.

The oranges offered for sale consisted of fair to poor South Australians, "Sunkist" and "Blue Goose" from California beautifully graded and well wrapped, and some fair Jamaica samples. Very small sweet oranges from South Australia were retailed at from ten to five for 1s., whilst Valencias of very fair quality were bringing up to three for 1s. The Californian oranges were of a lemon-yellow colour, with fine-textured skins, and were well cleaned, beautifully graded, nicely packed, and opened up in really good order. They were selling at four for 1s. The Jamaica fruit was also of a yellow colour, but were rougher in every way than the American fruit and were sold at six for 1s.

Lemons being retailed in the shops were either of very poor quality or small. The "Sunkist" lemons from California were really small, but were nicely graded and well prepared for market, and were selling at six for 1s., whereas the other type, which were locally grown, only brought 1s. per dozen, but were quite rough.

Dried fruits exhibited for sale consisted of Californian and Australian, with Dried Figs from Turkey. Most Australian samples compared quite favourably in appearance with the Californian, except Sultanas, in which case the American samples were much superior in colour.

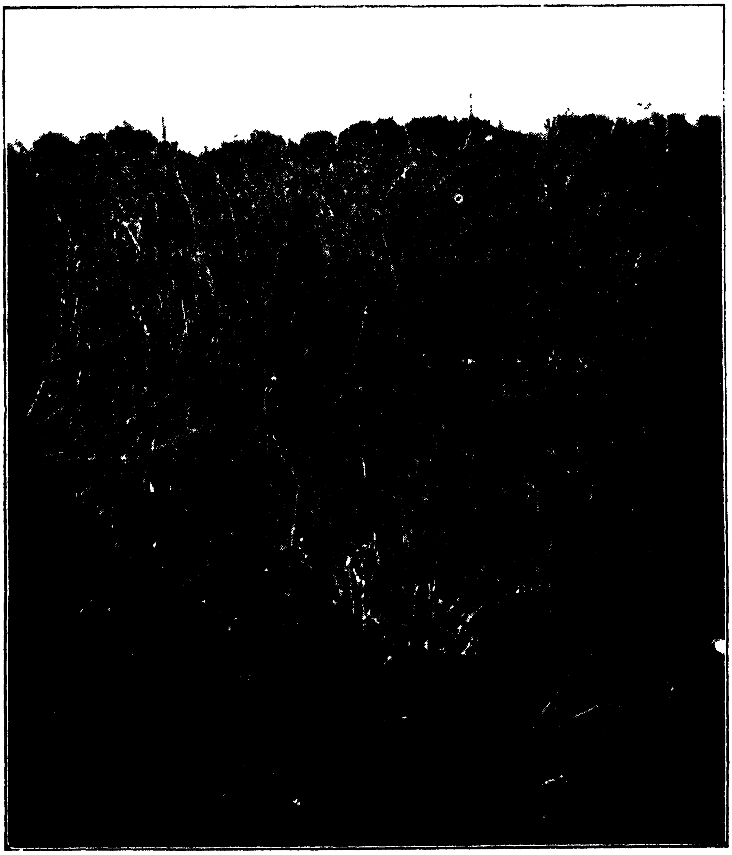
Relatively poor tomatoes were being sold at 1s. to 1s. 4d. per pound, but even at this high figure at the beginning of December the difficulties of transport would probably prevent South Australian shippers exploiting the market.

Wine and Brandy.—Very little wine is made in New Zealand, and most of what is used in the country must be imported, as well as the brandy. A little South Australian wine was seen exhibited for sale, but South Australian brandies could neither be seen nor heard of anywhere.

RECLAMATION OF LAND IN NEW ZEALAND.

An interesting experiment in the reclamation of land is being conducted at Napier. As a result of the earthquake of four years ago (February, 1931), which wrecked the town of Napier, the bed of the sea-marsh situated directly behind the town was raised some feet in height, and most of it, to the extent of thousands of acres, is now above sea level. The authorities controlling the town and neighbourhood of Napier, with some help from Government, have set about reclaiming this area for small holdings, and with very promising results, particularly as the area was covered with sea water only four years ago.

A small part of the area had drains cut some 18 months to two years ago, houses and sheds were erected, and quite a lot of families have already been settled. The salty land was well ploughed and planted, in most cases to mixed pastures, but small areas were used to try several other crops. Even though the period is so short since sea water was on the land, fairly good pastures have been established already on all of the well-drained places a bit higher than the general run of the country, and in some spots the body of feed is really good. Very few small areas of land in the portions already settled are still bare, but there is a fair amount where the pasture plants are only just established, with the plants rather small and stunted. The rainfall of the district is about 35 inches per annum on the average, and the degree of success already attained is such that the possibilities of good results for the whole scheme appear very promising.



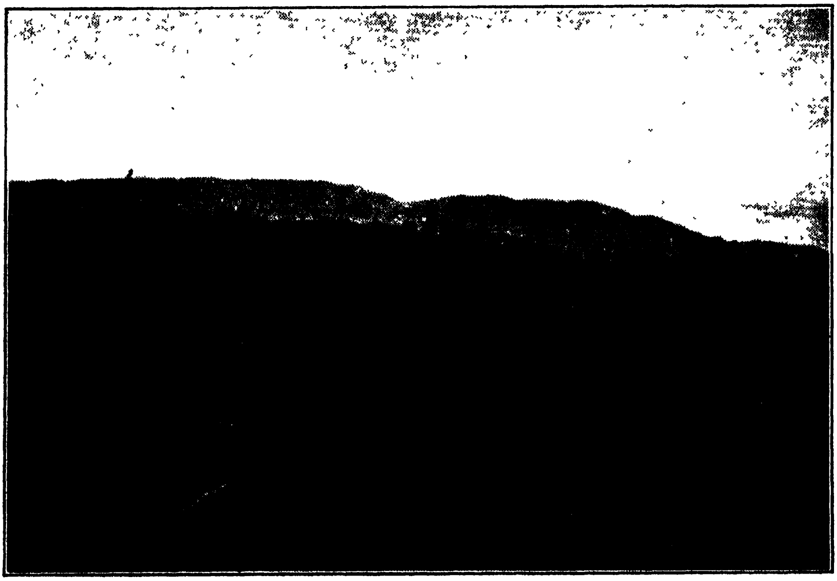
A 4-year-old Pasture on Reclaimed Pumice Land in New Zealand, which is capable of carrying two cows to three acres. Although considered useless until quite recently, the seeding to pasture mixtures, applying at least 3cwts. of superphosphate per acre per year, and consolidation with rollers and the tramping of stock, quickly renders this country into really good livestock farms.

Drains have been cut over most of the area not already settled, parallel to one another, and placed about 2 chains apart. Although this work had only been done a few months previously, there was already a strong growth of plants of various kinds, including considerable areas of Tall Fescue and King Island Melilot, on most banks and high places. The appearance of these forage plants (poor though they are considered to be in New Zealand) so soon after the surplus of saline water has been removed, augurs well for the rapid conversion of this area from a useless waste to fertile farming land.

Reclamation of Pumice Lands.

The Government of New Zealand is reclaiming what are known as Poor Pumice Soils, of which there are considerable areas in the North Island, and which, until quite recently, have been looked upon as being too infertile to be of much value for agricultural purposes. The strip of country which is largely composed of these soils commences south of Lake Taupo, stretches across the North Island, and extends northward to the Bay of Plenty.

The soils, whether on plains or in fairly steep hillocks, are of a sandy nature, and need much consolidation before many kinds of crops can be grown. In its natural state, covered as it is with stunted tangled scrub, of which the kind of tea-tree known as "Manuka" is the principal plant, and being so loose and open at the surface with rather coarse gravel at fairly shallow depths, it is most unpromising country from an agricultural point of view, and the results obtained by the Department of Agriculture are therefore really surprising, and must be most gratifying to those who sponsored the scheme.



A pure stand of Perennial Rye Grass on recently-reclaimed pumice land in New Zealand.

The Government provided plant and engaged men from the ranks of the unemployed to develop an area of some thousands of acres in the heart of the pumice-soil country, and after pastures were established, subdivided the land into dairy farms, erected buildings and fences, planted breakwinds, and leased the holdings to applicants on Renewable Leases. The cost to get these holdings into a reasonable condition for settlers was about £19 per acre, but it is generally conceded that the same work could be done by skilled labour at a figure not exceeding £15 per acre.

The Demonstration Farm conducted by the Department of Agriculture at Ngakuru, in the centre of one of the areas developed by Government, was seeded down three years ago, and although only 90 acres in extent, carries 60 cows in full milk, 3 horses, and rears all young stock, and although 51 acres were shut up for hay during November and early December, the grazing animals could not keep the pastures fed down sufficiently close.

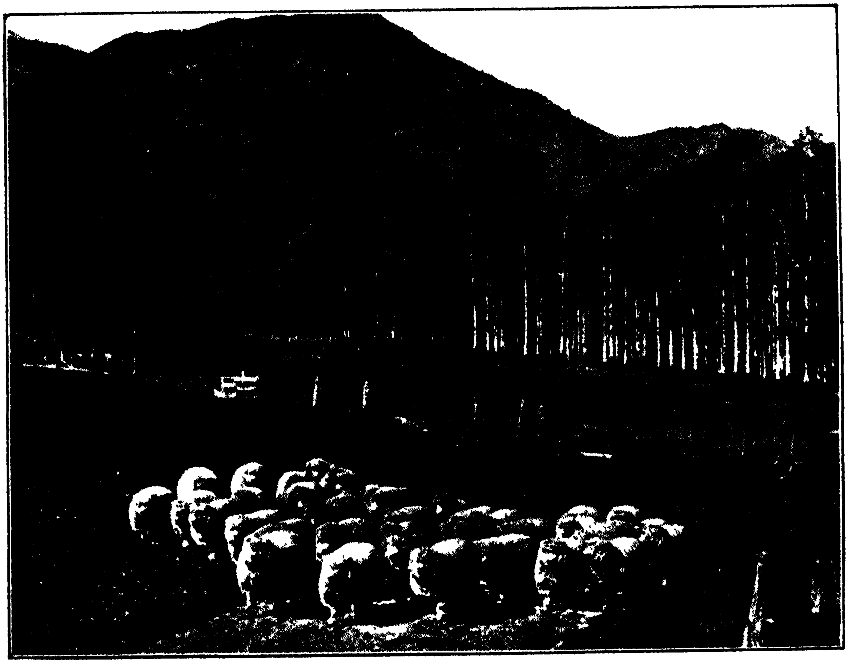
Judged by the results secured so far, it appears that three years after seeding the land to permanent pastures it will carry at least two milking cows to 3 acres and rear all young stock.

In establishing pastures on these pumice soils, the scrub is burnt, the land ploughed to a depth of 5ins. to 6ins., and then seeded with a mixture of 12lbs. Perennial Rye Grass, 6lbs. Cocksfoot, 3lbs. Crested Dogstail, 2lbs. Brown Top, 2lbs. Yorkshire Fog, 2lbs. White Clover, 1lb. Red Clover, and 1lb. *Lotus major* to the acre. At seeding a dressing of 3cwts. superphosphate per acre is given, and a further application of 3cwts. per acre within four months of seeding.

The pastures receive an annual application of 3cwts. superphosphate per acre. The tramping of livestock consolidates this country more and more each year, and as this is brought about the pastures improve.

NEW ZEALAND DEPARTMENT OF AGRICULTURE.

The Department of Agriculture of New Zealand is favourably known throughout the world, and more particularly in connection with the wonderful pasture improvement work it has so successfully undertaken, and in its understanding of economic dairying production, but as no opportunity offered to investigate closely its administration, it will suffice to draw attention to some differences to our methods:—



[Photo. from *New Zealand Illustrated*, 1935.

A New Zealand Stud Sheep Farm nicely located and well protected.

1. Veterinarians and all officers connected with animal and meat matters are officers of the Department, as they are in almost all countries in the world.
2. For instructional and inspectorial duties New Zealand is divided into four districts, each of which has a small sub-branch of the Department, with headquarters in one of the larger towns. These sub-branches are further subdivided into Fields Division, Livestock Division, and Fruit Division, with a Fields Superintendent and some Agricultural Instructors, a Livestock Superintendent, with Veterinary Surgeons and Meat Inspectors, and a Fruit Superintendent with assistants.

SUMMARY OF IMPRESSIONS GAINED IN NEW ZEALAND.

1. New Zealand is world-famed for its agricultural production, the quantity being extremely high for the size of the country and the relatively small population.

2. New Zealand is rightly described as one of the gardens of the world.

3. The export surpluses of agricultural products consist almost wholly of animal products.

4. The soils and climate of New Zealand are very favourable from an agricultural point of view, particularly for the development of evergreen pastures.

5. The pastures of New Zealand are probably the best in the world.

6. Appreciable areas of pastures carry nine or more breeding ewes per acre throughout the year, fatten up to 120 per cent. of lambs, then fatten several wethers or old ewes per acre, and some bullocks.

7. Most European pasture plants do well in New Zealand, but the principal plants used in pastures at present are White Clover and Perennial Rye Grass. Other pasture plants of outstanding importance are Cocksfoot, Rough-stalked Meadow Grass, Danthonia, and Red Clover.

8. Much of the success attained with pastures in New Zealand is due to intelligent management. It is generally recognised that correct balance can only be maintained by regularly and frequently grazing the pastures fairly hard, and again getting livestock on to them before the growth becomes coarse and thick.

9. Italian Rye Grass and Red Clover are used as a simple mixture where short-period pastures are required.

10. Rotational grazing is practised to prevent fouling the pastures and to reduce the risk of eating out the better-quality fodder plants, rather than seeking more proteinous forage.

11. The stirring of the surface of pastures does not appear to be popular in New Zealand, but the droppings of animals are spread frequently with light harrows or something of the kind.

12. Great care is taken by most graziers to remove bad weeds from pastures.

13. Top dressing pastures with superphosphate is general, except in the very best districts, and 3cwts. to 6cwts. per acre per year is the usual dressing. In some places lime, at the rate of 5cwts. to 10cwts. per acre every second year or so, is applied.

14. The Seed Certification Scheme in operation in New Zealand is having a marked effect in the improvement of pastures.

15. New Zealand can maintain, excellently, large numbers of sheep of a type stronger than Merino, but does not appear likely to become a serious competitor with Australia in the production of fine wools.

16. New Zealand holds pride of place in British markets for fat lambs, which she produces well, properly prepares for market, and judiciously advertises.

17. New Zealand exports over 8,000,000 lamb carcasses a year, the vast majority of which are sired by Southdown rams out of pure-bred Romney Marsh ewes or crossbreds containing a lot of Romney Marsh blood.

18. Lambs are purchased on the farms in New Zealand and arrangements for killing are then made so that they can be taken from their mothers to be slaughtered the same day.

19. Very high lambing percentages are secured in New Zealand, which appears to be due largely to the pure-bred Longwool ewes, or the crossbred ewes with a lot of Longwool blood, and the high fertility of Southdown rams.

20. In 1922 the Government created a Meat Producers' Board which has functioned very actively, and has given general satisfaction to most parties concerned.

21. The principal functions of the Board are to regulate shipments so that there are no temporary shortages nor gluts on the market, to endeavour to reduce costs between producer and consumer, to present the meat to the purchaser in the best possible condition, to advertise adequately the meat in consuming countries, and to assist producers wherever possible.

22. Considerable reductions in the costs of handling the meat have been brought about since the Board came into existence. Reductions in freight have been made on the 1922 rates of from 40 per cent. to 58 per cent. on various lines and have meant the following very considerable savings:—

	s.	d.	
On 60lbs. sheep	3	8	per head
35lbs. lamb	2	0½	"
120lbs. pig	9	2½	"
720lbs. bullock	40	0	"
500lbs. cow (boned), from 38s. 5d. to 43s. 9d. per head			

Reductions have also been made in insurance rates, charges of the Port of London Authority, and other British port controls, slaughtering, freezing, and handling charges in New Zealand, and in the cold-storage rates in England. The latter is estimated to save £50,000 per annum.

23. The Meat Producers' Board has over £25,000 a year available for advertising New Zealand meat, from small levies of ¾d. a carcass of mutton, lamb, pork, and veal, and ⅜d. a quarter of beef, and this after all administration and other expenses are paid.

24. The Board helps producers in the Dominion in all sorts of ways, such as making grants to shows, research work, entomological investigations, &c.

25. The branding of exported meat has been done successfully in New Zealand by using the following fluid:—

Water	6 parts by weight
Methylated spirits	6 parts
Sugar	3 parts
Glycerine	1 part
Stain to suit.	

26. Jersey cattle, pure-bred and grade, predominate in New Zealand.

27. High-class Jersey bulls are to be seen throughout the dairying districts of New Zealand.

28. Cows in milk have increased in New Zealand from 381,000 in 1901 to 1,933,000 in 1933, and production of butterfat per cow from 127.20lbs. to 220.80lbs.

29. Co-operative Dairy Companies play an important part in the dairying industry of the Dominion, for of the 140,000 tons of butter exported in 1933-34 all but 8,000 tons were shipped by Co-operative Companies, and of the 110,000 tons of cheese, proprietary firms only shipped 2,000 tons.

30. Costs of manufacture of butter and cheese have been reduced very considerably in New Zealand; butter from 2.65d. per pound of butterfat in 1925 to 1.67d. in 1934 and cheese from 4d. per pound of butterfat to 2.5d.

31. If a dairy factory or group of factories desire an instructor, the Government provides a trained man and the factory pays half the salary and all travelling expenses. The instructor deals principally with clients of the factory engaging him.

32. The natural conditions of New Zealand are almost ideal for dairying, and where there is a deficiency of any kind it is usually the easily corrected shortage of phosphorus.

33. It does not appear that New Zealand will ever become an important grain-producer, and if this is so the Dominion will always be handicapped in producing bacon pigs. In such an important dairying country pigs will continue to be essential, but are more likely to be marketed as porkers than baconers.

34. New Zealand land-reclamation schemes, particularly of the pumice soils, are proving very successful, and will add a considerable area of good pasture to the country's already large area.

35. In New Zealand, veterinarians and officers dealing with animal and meat matters are attached to the Department of Agriculture, as they are in almost all countries of the world.

(*To be continued.*)

THE STATE EXPERIMENT ORCHARD, COROMANDEL VALLEY, NEAR BLACKWOOD, SOUTH AUSTRALIA.

[By GEO. QUINN, Chief Horticultural Instructor.]

(Continued from page 57.)

In Table I. the average girth measurements of the various rootstocks, stem-pieces, and stems, together with the mean height and limb spread attained by each of the fruiting varieties under trial—as applied to from 5 to 24 trees in each instance—are set forth.

TABLE I.—*Showing the average dimensions of trunk and limb spread developments of apple trees grown on Northern Spy, Winter Majetin, and Cole's Blight-proof Paradise rootstocks, and on intermediate stem-pieces of Dunn's Seedling, Rokewood, Winter Majetin, Cole's Blight-proof Paradise, and Rome Beauty, all previously grafted on Northern Spy rootstocks:—*

No. of Trees.	Average Girth Rootstocks. (Inches.)	Average Girth Stempieces. (Inches.)	Average Girth Tree Stems, 10-12ins. above Union. (Inches.)	Average Mean Height of Trees. (Feet.)	Average Mean Spread Trees. (Feet.)	Average Elevation of Widest Spread of Trees. (Feet.)
NORTHERN SPY ROOTSTOCKS.						
24	21·28	—	19·24	8·90	12·96	6·00
WINTER MAJETIN ROOTSTOCKS.						
5	15·90	—	14·35	6·09	9·70	4·60
COLE'S BLIGHTPROOF PARADISE ROOTSTOCKS.						
5	25·30	—	21·15	8·50	12·60	5·40
DUNN'S SEEDLING STEMPIECES.						
6	22·25	19·96	18·79	8·33	12·33	5·83
ROKEWOOD STEMPIECES.						
6	23·54	20·75	21·62	9·58	12·50	6·66
WINTER MAJETIN STEMPIECES.						
5	17·25	14·85	13·50	6·40	8·80	4·60
COLES BLIGHTPROOF PARADISE STEMPIECES.						
5	15·55	13·55	12·80	6·50	8·30	4·60
ROME BEAUTY STEMPIECES.						
6	23·92	22·58	21·25	9·75	14·66	6·00

From a perusal of these figures, and particularly when made in conjunction with a critical view of the trees in the plot, there would appear to be some evidence that the Winter Majetin rootstock has exercised a very restraining influence on the growth of the trees worked upon it both when used as a rootstock direct and when placed in the capacity of a stem-piece intermediate between a Northern Spy rootstock and a fruiting variety. It must be admitted that the surface soil in portion of the second row towards the western end has an inferior appearance, but the comparative failure of nearly all of the fruiting varieties to make normal growth when in association with this stock is not in the opinion of the writer wholly accounted for by this small differentiation in the soil conditions.

The Cole's Paradise on the other hand—as has been remarked earlier—permitted or encouraged a high average expansion in all parts of the trees of most of the kinds worked directly upon it. When, however, it was inserted between the Northern Spy rootstocks and the fruiting varieties, the position is very much reversed. For instance, the reduction represents upwards of 26 per cent. in girth of stock, 33 per cent. in the girth of tree stem, 26 per cent. in height, and 35 per cent. in mean spread, as compared with the same varieties worked direct on Northern Spy rootstocks.

Taking the average dimensions of the trees worked direct on Northern Spy rootstocks as a basis for comparison the intrusion of stem-pieces of neither the Dunn's Seedling, Rokewood, nor Rome Beauty varieties affected the development of the various parts of the superstructures of the trees to any appreciable degree whatever.

In so far as the increase in the average development of the trees grown on the Rome Beauty intermediate stem-pieces is concerned, the superior texture and suspected higher degree of fertility of the land in which they are planted most probably account for the greater proportion of the differences revealed in Table I. By way of comparison with the data presented in Table I. the average dimensions—calculated from the original individual measurements taken from all of the 82 trees of the fruiting varieties worked on all of the rootstocks and stem-pieces—were as follows:—

Girth of Rootstocks.	Girth of Stempieces.	Girth of Tree Trunks.	Mean Height of Trees.	Mean Spread of Trees.	Elevation of Mean Spread.
(Inches.)	(Inches.)	(Inches.)	(Feet.)	(Feet.)	(Feet.)
21·75	18·18	19·35	9·23	11·91	5·82

Although the sizes of the circles in the sketch plan indicate a very great diversity in the development of the individual trees of the different fruiting varieties when grown on all of these rootstocks and stem-pieces, still, the average dimensions respectively attained by these varieties coincide very closely with what, in this State at any rate, is widely accepted as characteristic of each sort. Esopus Spitzenburg, Baldwin, Shockley, Granny Smith, Statesman, and Tasma are all considered to be strong vigorous-growing varieties. Cleopatra is slightly less so and Jonathan is weaker still. These growth characteristics are practically borne out by the data given in Table II.

TABLE II.—*Showing the average dimensions reached by the different fruiting varieties when grown on all of the various rootstocks and stem-pieces used in these trials:*—

No. of Trees.	Variety.	Average Girth, Root-stocks.	Average Girth, Stem-pieces.	Average Girth, Tree Stems.	Average Height of Trees.	Average Spread of Trees.	Average Elevation of Spread of Trees.
		(Inches.)	(Inches.)	(Inches.)	(Feet.)	(Feet.)	(Feet.)
*7	Baldwin	21·71	16·50	19·32	9·14	13·57	6·14
15	Cleopatra ...	21·97	15·79	18·00	8·20	11·47	5·67
13	Cleopatra Q .	21·25	18·50	18·37	8·38	12·19	5·61
15	E. Spitzenburg	20·23	20·46	18·83	8·57	12·66	5·60
9	Jonathan ...	17·97	16·17	16·00	7·28	10·66	5·22
†3	Shockley ...	25·33	25·75	23·41	9·50	14·66	6·33
12	Granny Smith	24·65	24·19	21·66	11·50	12·17	6·00
4	Tasma	22·94	—	23·62	12·62	10·12	6·25
4	Statesman ..	24·19	21·12	22·94	12·37	8·62	6·00

* 15 trees until 1929 when 8 were top-grafted to Tasma and Statesman.

† 15 trees until 1927 when 12 were top-grafted to Granny Smith.

It would appear, therefore, that with the exceptions of the variations associated with Winter Majetin and Cole's Paradise, the various rootstocks and intermediate stem-pieces have exercised very little influence on the ultimate growth developments attained by the varieties of apple trees used in these trials as compared with those of the same kinds worked directly on to the Northern Spy, as is followed in ordinary commercial orchard practice in the apple growing States of the Commonwealth of Australia.

Further references will be made to the trees displaying these exceptions when the production of fruit and the occurrence therein of Bitter Pit are under consideration.

Fruit Production and the Occurrence of Bitter Pit.

References have previously been made to the generally accepted statement that this diseased condition is more prevalent in the fruit borne on young trees or on more matured trees which have been subjected to severe pruning applied during the dormant season of the year, or on normally healthy apple trees carrying what is deemed to represent a subnormal quantity of fruit. This may be summed up as representing those trees in which the vigour of vegetative activity finds expression in the rapid production of strong annual shoots bearing an abundance of leaf growth.

In tabulating the data of fruit production accumulated over periods of from 19 to 23 harvests from the various series of trees grown in these trials an attempt has been made to show to what extent the question of the prevalence of Bitter Pit in its fruit is bound up in the age of the apple tree.

For the information of those who desire to study this aspect of the trials, a series of tables numbered III. to XI. has been drawn up in which the total production of fruit of each variety when grown on each of the three rootstocks and five intermediate stem-pieces has been divided into three cropping periods.

The first period represents the earliest croppings collected from the trees from the inception of the bearing stage of each one up to 1917. This period must necessarily cover a variable term of years owing to the slightly different ages of the trees and the cropping characteristics peculiar to the respective varieties. The second period extends from 1918 to 1924—in the case of the trees on Northern Spy stocks and on intermediate stem-pieces of Dunn's Seedling and Rokewood. For those grafted on Winter Majetin and Cole's Paradise rootstocks, and those on stem-pieces of these two sorts, as well as those on intermediate stem-pieces of Rome Beauty—all stem-pieces being established on Northern Spy rootstocks—the second period extended from 1918 to 1927. This and the subsequent differences in the third period, arose owing to the first-named having been planted earlier, they had arrived at a stage of maturity in 1924 which the latter had only attained by 1927. The third period ranged from 1925 to 1934 in the case of those trees worked on the Northern Spy stock and on Dunn's and Rokewood stem-pieces established on Spy roots, and from 1927 to 1934 in respect to the varieties grown on Majetin and Cole's Paradise rootstocks and the stem-pieces of the Majetin, Paradise, and Rome Beauty. In all cases the calendar years quoted herein are inclusive, that is to say, the period 1927 to 1934 covers the crops harvested during eight years.

It should be mentioned here that the presentation of a more completely satisfactory comparison of the effects of the different rootstocks and stem combinations on the development of the trees and the occurrence of Bitter Pit in the fruits of all of the varieties included in the trials, has been rendered much more difficult owing to the repeated demands that the revenue from this orchard should be made to approximate nearer to the expenditure in conducting the various operations therein.

This led to the writer reluctantly agreeing to the request of the orchard manager to be permitted to work over most of the trees of the two apparently more susceptible and least popular varieties, viz., Baldwin and Shockley, to more modern export kinds.

In 1927 Granny Smith, and two years later Tasma and Statesman, were top-grafted on to these sorts. Twelve trees of Shockley were thus reworked to Granny Smith, and eight trees of Baldwin being regrafted—four each to Tasma and Statesman. This proceeding removed from the records the possibilities of eight crops from Shockley and six from Baldwin at a time when both of those sorts may have reasonably been expected to produce their highest yields of apples containing the lowest percentages of Bitter Pit affected fruits.

Direct Rootstocks.

NORTHERN SPY.

Tables III. and IV. show the total yields harvested between 1912 and 1934 from six varieties grafted directly on to Northern Spy rootstocks, Cleopatra Q being for the meantime classed as a separate variety. In the cases of Shockley and Baldwin, breaks occur from 1927 and 1929 respectively, thus reducing the numbers of bearing trees recorded in Table III. In Table IV. the yields of only one tree of each of these six varieties grown on the Northern Spy rootstock are given without any break in the cropping data from 1912 to 1934—a period of 23 harvests. It will be noted that the tardy arrival at the cropping stage of the Baldwin variety is outstanding when grafted on this rootstock, but it also occurs when this variety is worked directly on to the Winter Majetin and Cole's Paradise rootstocks. The Jonathan also displayed a similar delay when grown on the Majetin stocks. This deferred cropping habit maintained by Baldwin throughout the first cropping period, 1912-1917, coincided with a prolonged period of vigorous shoot growth on the part of this variety.

The average annual crops borne during the second period, 1918-1924, by each of the seven trees of Baldwin as recorded in Table III. weighed 73lbs., and at the same time the annual average crop was 117lbs. from the single, but older, tree of that variety in Table IV. Singularly enough the percentages of Bitter Pit affected apples were 56.76 in each instance.

It is probable that this deferred fruiting habit in the Baldwin variety is largely the cause of its fruits displaying a greater percentage of Bitter Pit during the 1918-1924 period than those of any of the other varieties used in these trials.

In all of the other varieties, almost without exception, the second cropping period of seven years, viz., from 1918 to 1924, reveals a much higher percentage of Pit affected apples than was recorded during the first cropping period covering six years from 1912-1917, when the annual yields of fruit were still very limited in weight per tree.

The single trees of all the varieties recorded in Table IV. were planted in 1908, whilst the other six, which make up the seven recorded in Table III. worked on Northern Spy stocks, were planted in 1910. This increased age, combined with any advantage accruing to an outside or headland position, appears to be the only explanation of their greater average yield per tree during the second period as quoted above.

The figures of yields recorded during the third period, 1925-1934, cover the crops of 10 seasons. They indicate that the trees have settled down into what may be deemed the normal habit of fruiting characteristic of each variety. During this period the growth had slackened into the formation of short laterals and fruiting spurs, with insignificant terminal extensions on the framework limbs. It will be noted in Table III. that the annual yields per tree, other than in the cases of Baldwin and Shockley varieties, show increases averaging around 60 per cent. greater than found in the second period. On the other hand, the percentages of Bitter Pit affected apples have fallen to a very greater extent. In Table IV., where the fruit of only a single tree of each variety has been recorded over an unbroken period of 23 years, the trees of Baldwin and Shockley may be judged on even terms with those of the other sorts. In this table the increased yield per tree during the third period ranges from 39.14 in Cleopatra Q to 70.56 per cent. in Shockley. This average increase, however, is 54.20 per cent., and singularly this drop was due to Cleopatra fruits showing only 55.74 per cent. and Cleopatra Q 39.14 per cent. increases. It will be noted also that the percentages of apples affected by Bitter Pit was very low in all varieties during the third period.

Attention is drawn to the fact that where the produce of a greater number of trees (36) over the period is shown, as in Table III., the percentages of Bitter Pit affected apples are higher than in Table IV., carrying only six or a single tree of each sort. This position evidently would have been less pronounced had the crops from the full number of trees of Shockley and Baldwin been recorded during the last eight and six years respectively. In this respect it will be found that by omitting the data obtained from the Baldwin and Shockley varieties from Tables III. and IV., thus reducing the number of trees in Table III. to 22 and covering four sorts, the total yield for 23 cropping seasons equals 51,579lbs., of which 9,013lbs. were affected by Bitter Pit, or an equivalent of 17.47 per cent., in lieu of 20.60 per cent. as finally set out in detail in Table XII. The omission of the fruits of these two varieties from Table IV. leaves a total of 9,723lbs. of apples, of which 1,006lbs. were "pitted." This represents 10.35 per cent. as compared with 13.03 per cent. when this fruit has been included for the full term of 23 years, over which it was recorded in Table IV.

Calculating from the time of planting the trees it would appear that there is in this plot definite evidence that, under similar environmental conditions in the case of the varieties tested on Northern Spy rootstocks, the Bitter Pit is likely to reach the zenith of its virulence, or, in other words, the apple grower may expect to suffer the greatest losses of fruit from Bitter Pit injuries during the first 16 years of the plantation's existence. This would seem to be irrespective of whether the trees begin to crop slightly at the fourth or fifth year after being planted in the orchard or whether fruition be delayed to a later period, providing, always, that average good vigour of vegetation be maintained in them.

The similarity of the figures of yield in the first fruiting periods in Tables III. and IV. indicate that the small yields quoted have all been recorded from the single trees of each variety contained in Table IV.

As only a single tree of Jonathan was grown direct on Northern Spy rootstock, the data from that was included in both Tables III. and IV. This has no significance further than to indicate that in all cases the data in Table III. also includes that contained in Table IV.

WINTER MAJETIN.

In comparing the yields from the single tree of each variety worked on Winter Majetin rootstocks and the percentages of apples therein found affected by Bitter Pit, as set out in Table V., with those in Table IV. on Northern Spy stocks, it will be noted that whilst, with the exception of Cleopatra variety, the total crops have weighed much less in the aggregate, the percentage of Bitter Pit affected apples was slightly higher, viz., 14.80 per cent. Majetin as against 13.03 per cent. from the trees on Spy rootstocks. This difference is not at all convincing and might disappear when repeated on a greater number of trees. When viewed from the apple grower's standpoint, however, this slight difference of loss from Bitter Pit is overshadowed by the greatly reduced yields harvested from the trees grown on the Majetin rootstock. If these differences in weight of total yields are borne out in larger scale tests, the complete disappearance of Bitter Pit from the crops borne by trees on Majetin roots could not compensate for the disparity between the weights of sound fruit apparently obtainable from these varieties when grown on the Northern Spy rootstocks.

In the figures obtained from the trees growing on Winter Majetin stocks set out in Table V., it will be seen that for the last seven cropping seasons no data was entered for the Shockley variety. If the produce from this variety be wholly omitted, and the test confined to the produce of the remaining five sorts, the percentage of Bitter Pit affected fruit would only recede 18 per cent. Allusion has been made to the restricting action exercised or seemingly exercised by the Winter Majetin stock and stem-piece on the subsequent growth of the varieties of apple tree grown upon it. If this proves to be a consistent feature, it certainly has given no evidence thus far that it has noticeably increased fruit production during either of the earlier periods, as is the wont of dwarfing stocks used on other kinds of fruit trees.

COLE'S BLIGHT-PROOF PARADISE.

In Table VI. the records of the total crops produced by a single tree of each of the six fruiting varieties when grown on Cole's Paradise rootstocks are set forth in three cropping periods. When compared with the crops recorded from the same number of trees of these varieties grown on Northern Spy and Winter Majetin rootstocks, *vide* Tables IV. and V., it will be seen that they stand about midway between the yields of those on the above-named rootstocks. The percentage of apples affected by Bitter Pit, viz., 17.26 per cent., is somewhat higher than found in the gross yield from the same number of trees on either of the other kinds of stocks. If, with an increased number of trees this percentage was found to rise—as has been the case in these trials with the trees on Northern Spy rootstock—*vide* the summary set out in Table XII.—or if the percentage of diseased apples merely remained stationary when a greater number of units of each variety were grown, then one would, in the writer's opinion, be justified in stating at this stage that the use of neither of these two last-named rootstocks in preference to the Northern Spy could be recommended as a means of reducing the losses from Bitter Pit in our orchards.

INTERMEDIATE STEM-PIECES ON NORTHERN SPY ROOTS.

Tables VII. and VIII., contain the fruiting data recorded from similar varieties of apple trees stem-grafted on to the intermediate growths of Dunn's Seedling and Rokewood respectively. There is one tree of each of the six varieties worked on each of the above stem-pieces. The unbroken fruiting records of these trees is shown in three periods extending in all cases from 1912 to 1934—23 fruit crops.

The outstanding influence of the use of the intermediate stem-piece is seen here in the consistent earlier formation of the fruiting habit by those varieties which, when placed directly on Northern Spy, Winter Majetin, or Cole's Paradise, showed tardiness in that respect. Here again in most instances we find the repetition of an increased percentage of Bitter Pit affected apples during the middle period of cropping, *i.e.*, in the seven crops harvested between 1918 and 1924, followed by a great shrinkage of the percentage of waste due to this disease during the ten crops gathered between 1925 and 1934. The different varieties continued to maintain those positions relative to the comparative susceptibility of their fruits to Bitter Pit, which they had established when grown directly on the three previously described blight-proof rootstocks. In this respect, with the exception of those of the Jonathan and Shockley varieties, the percentages of Bitter Pit affected apples were lower than was recorded from the six trees worked directly on Northern Spy, which grew in regular alternations with them throughout the first row in the plot. With the exceptions of Cleopatra Q and Shockley, the trees on the Rokewood stem-pieces showed slightly lower percentages of Bitter Pit than did those on the Dunn's Seedling stem-pieces. In respect to the comparative total yields of these trees, viz., six direct on Northern Spy stocks and similar numbers on Dunn's Seedling and Rokewood stem-pieces respectively, those on the Spy roots produced an average annual yield per tree of 100.54lbs., those on Dunn's intermediate stem-pieces 87,96lbs., and those on Rokewood stem-pieces, 108.45lbs over the 23 crops. It has been previously pointed out that the total yield of apples from the six trees grown direct on Northern Spy, planted in the first row with Dunn's and Rokewood weighed 13,875lbs., of which 1,808lbs. or 13.03 per cent. were affected by Bitter Pit. Similar numbers of the same varieties on the Dunn's and Rokewood stem-pieces produced 13,139lbs. and 14,966lbs. respectively. Of these quantities 1,347lbs. or 11.09 per cent. on Dunn's and 1,789lbs. or 11.95 per cent. on Rokewood stem-pieces were destroyed by Bitter Pit. These figures indicate that the six trees on Dunn's Seedling stem-pieces produced 1,275lbs. less and that those on Rokewood stem-pieces yielded 1,110lbs. more clean fruit than did a like number of trees grown direct on Northern Spy rootstocks throughout the 23 years of cropping. This increase equals an annual averave of 48.26lbs. of non-pitted apples or 8.04lbs. per tree more from those on Rokewood stem-pieces than from those growing direct on Spy stocks.

In Tables IX. and X. the fruiting records from the trees on intermediate stem-pieces of Cole's Paradise and Winter Majetin respectively are quoted in three periods. The first covers four crops from 1914 to 1917, the second, from 1918 to 1927, equalling 10 crops, and the third, from 1928 to 1934, covering seven harvests.

The percentage of diseased fruits from the trees on Cole's Paradise stem-pieces varied slightly from the order of susceptibility hitherto indicated as peculiar to the different varieties. The apples from the reputedly most susceptible, viz., Baldwin and Shockley, were still easily the most affected by Bitter Pit. Although Esopus Spitzenburg and the Jonathan exchanged positions the reduced quantity of infected fruits from the former was much more marked than the rise of diseased specimens in the latter, which has hitherto consistently shown greater immunity from Bitter Pit than any other variety used in the trials. The marked feature attached to the trees on the Cole's Paradise stem-piece is their much reduced yields of apples compared with the crops from the same sorts grown direct on Northern Spy rootstocks or where the Dunn's and Rokewood stem-pieces have been inserted between them and the Spy root system. It will be recalled that the Paradise stem-pieces also restrained the development of stems and branches of the trees into which they had been intergrafted.

This may be readily detected from the sketch plan showing the mean spread of the top of each of the trees grown on this variety of stem-piece.

The total fruits recorded in Table X. from the trees grown on Winter Majetin stem-pieces show a slightly greater decline in the gross quantity than that from the trees on the Paradise stem-pieces. This, however, was probably due to the lesser number of crops carried as set out in Table XVI. They illustrate the rise to the maximum of injury from Bitter Pit during the second fruiting period covering ten harvests from 1918 to 1927 and a rapid fall during the final seven crops, 1928 to 1934. The percentage of loss in the respective varieties, though somewhat increased in most instances, has not seriously disturbed the order of susceptibility hitherto attributable to them when grown on the other rootstocks and stem-pieces.

In Table XI. the data collected from the two trees of each five varieties grown on the Rome Beauty intermediate stem-pieces worked on Northern Spy roots are also set out in three cropping stages. The first of these covers only three crops, 1915 to 1917, the second from 1918 to 1927 taking in 10 harvests, and the third period from 1928 to 1934 includes the returns from seven fruit seasons. The fruits of these varieties still displayed the same comparative order of susceptibility to the disease as when grown on the other rootstocks and stem-piece combinations.

The figures quoted in Table XII. giving the summarised total yields gathered from all varieties grown on each kind of rootstock and stem-piece included in these trials indicate that the second highest average yield of fruit per tree per annum collected from the intermediate stem-pieces was obtained from this combination over their full cropping period. This was achieved notwithstanding that two trees of each of the two heavier bearing varieties, viz., Shockley and Baldwin, were top-grafted and consequently out of action for their latest and presumably their most prolific eight and six crops respectively.

The percentage of apples affected by Bitter Pit from the trees on the Rome Beauty stem-pieces was, however, fairly high, being 16.27 per cent. as compared with the general record of 17.38 per cent. of diseased fruit collected from the total yields of the whole series of tests as set out in the same table, although this percentage of Bitter Pit is appreciably less than that found in the 24 to 36 trees, worked directly on Northern Spy rootstock. When calculated on an annual return per tree from a more nearly comparable number of crops from the same varieties on the Spy stocks—as set out in Table IV.—this seeming advantage disappears. To illustrate this further, when the necessary deductions of crops from the two trees of Shockley top-grafted over in 1927, and the two trees of Baldwin top-worked in 1929 are taken from the original 10 trees growing on the Rome Beauty stem-pieces, the returns represent the equivalent of 162 individual tree yields throughout the cropping period of 20 harvests from 1915 to 1934 inclusive. In the detailed results from the six trees as contained in Table IV. on the Spy stocks there were 23 harvests from 1912 to 1934, or an equivalent of 138 tree yields. Calculated on this basis the average annual yield per tree from those on Rome Beauty stem-pieces has been 105.36lbs. and from the trees grown on Northern Spy direct 100.54lbs. In these quantities the respective weights of apples annually recorded as being free from Bitter Pit have averaged 87.04lbs. for each tree grown direct on Northern Spy stocks and 84.56lbs. for each of those developed on the Rome Beauty intermediate stem-pieces.

The withdrawal of the 12 trees of Shockley for the presumably most productive eight crops and of six crops of a similar nature from eight trees of Baldwin, have, it must be admitted, interfered to an uncertain degree in the returns recorded in the trials made with all of the rootstocks and stem-piece combinations other than those contained in Tables IV., VII., and VIII.

Estimations based on the average returns recorded of Bitter Pit affected and sound apples during these periods from the trees of these two varieties as set out in Tables IV., VII., and VIII., do not indicate much variation away from the percentages of diseased fruit as set out in the final Tables, XIII. and XIV. It would appear, therefore, that without wholly discarding the data obtained from these two varieties in all tables other than the three mentioned above, it may be assumed that, whilst the aggregate yields of the remaining tests have undoubtedly suffered an unknown reduction it is possible the comparative percentages of fruit affected by Bitter Pit in the various trials would not have undergone much change from that reduction.

In conclusion it may be pointed out that from 48 of the original varieties of trees grown on the direct rootstocks 78,857lbs. of apples were harvested between 1912 and 1934. Of these 19.76 per cent. were destroyed by Bitter Pit. From the 34 similar varieties of trees grown on the five different intermediate stem-pieces 53,203lbs. were recorded, of which 13.86 per cent. were affected by that disease.

The data contained in Table XV. shows the total yields and percentages of apples affected by Bitter Pit borne by the Granny Smith, Tasma (Democrat), and Statesman varieties which were top-grafted on the Shockley and Baldwin varieties in 1927 and 1929 respectively. As hereinbefore explained, the first-named variety was top-grafted on to the main arms of mature trees of Shockley which were grown on each of the various rootstocks and stem-pieces and of the two last-named sorts on similarly mature trees of Baldwin, some of which grew on Northern Spy rootstocks direct, and of the last-named (Statesman) two trees had been developed on Rome Beauty stem-pieces above the Northern Spy rootstocks. In the case of the 12 trees of Granny Smith the figures represent the six-year cropping period extending from 1929 to 1934, and in respect to the Tasma and Statesman, only two crops, viz., 1933 and 1934, are represented. These trees have all made very excellent growth, but those top-grafted on trees growing on both the Winter Majetin root system direct and on the intermediate stem-pieces of that variety on Spy roots, have borne indifferently. The percentage of fruit affected by Bitter Pit, however, though comparable are generally somewhat lower than those yielded by the other varieties during their third or more matured periods of cropping. This coincides very closely with the general observations made respecting the comparative susceptibility to the disease displayed by these three varieties of apple when grown in commercial orchards in this State.

The rapid settling into the bearing habit—notwithstanding the very strong growth made during the first two or three seasons after being grafted—would seem to offer some indication that the matured condition of the roots and intervening stems, and main limbs of which the various frame structures have been composed, may have exercised some degree of restraint on the occurrence of the Bitter Pit defect in the fruits.

The Susceptibility of the Fruiting Varieties to Bitter Pit.

References have been made to the apparent differences in the degree of resistence displayed by the fruits of the original fruiting varieties used in these trials. The data collected between 1912 and 1934 from these trees enables one to compare with confidence three varieties and one sub-variety, viz., Cleopatra, Cleopatra Q, Esopus Spitzenburg, and Jonathan, and with a slight reservation, Baldwin and Shockley varieties also. Had all of the trees of these two latter sorts been retained through the latest six and eight crops respectively, their positions may have been modified.

From the figures available a small table (XVI.) has been produced in which the comparative susceptibilities of these varieties to Bitter Pit when grown on all of the rootstocks and stem-piece combinations, is stated in terms of percentages by weight of the Bitter Pit affected apples. The calculations have been worked out on the basis of the varying numbers of 'cropping years'' recorded for each variety grown on the various rootstocks and stem-pieces. These variations have chiefly been due to the varying ages of the trees on certain of the stocks, also to the top-grafting of two of the varieties (Baldwin and Shockley) several years before the last year (1934) dealt with in this report. In some isolated seasons odd trees failed to crop. As these trees were not consistently confined to any particular portion of the plot, nor to any variety or rootstock more than to the others, the cause or causes of these intermittent crop failures cannot be explained.

TABLE XVI.—*Showing the Comparative Susceptibility of the different Scion Varieties to Bitter Pit Disease.*

Variety.	No. Tree Crops from all Stocks.	Average Weight of each Crop.	Total Yield	Affected by Bitter Pit.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
Baldwin	222	75 1½	16,671 8	5,686 3	34·11
Cleopatra	281	130 3¼	36,586 11	6,079 1	16·59
Cleopatra Q	252	128 10	32,411 5	5,776 8	17·82
Esopus Spitzenburg ..	291	69 8½	20,233 0	1,684 12	8·33
Jonathan	190	66 5	12,596 7	415 5	3·30
Shockley	196	69 3	13,561 9	3,329 0	24·55

SUMMARY AND DISCUSSION.

Since 1908 a series of trials have been carried out with apple trees in the State Experiment Orchard at Blackwood, South Australia, using three varieties of rootstocks and five intermediate stem-pieces. The latter, with the exceptions of two trees, were all developed on Northern Spy roots, which is the rootstock universally adopted in the commercial propagation of apple trees in Australasia. The former were propagated on their own respective roots. The objects sought in these trials were:—

(1) To ascertain if possible whether the use of the Northern Spy variety as a rootstock—the fruits of which are highly susceptible to the Bitter

Pit disease—exercised an undesirable influence in the direction of accentuating the occurrence of the disease in the fruits of the other susceptible varieties of apple worked directly upon it, and

(2) Conversely to note whether the use of two other varieties as direct rootstocks—the fruits of which are reputedly resistant to Bitter Pit—would impart some of such powers of resistance to the fruit of more susceptible commercial varieties grown upon them.

(3) Following a similar line of reasoning (*a posteriori*) to note if the interposition of a piece of growth taken from a variety producing apples rarely affected by Bitter Pit intermediate between the Northern Spy rootstock and the fruiting variety, the prevalence of Bitter Pit in the fruits of the latter would be abated.

(4) In pursuance of these objectives the varieties used as direct rootstocks were:—

Northern Spy,

Winter Majetin,

Cole's Paradise.

All of these are accepted in Australia as possessing "Blight proof" qualities in so far as the Woolly Aphis (*Eriosoma lanigera*, Haus.) is concerned.

The intermediate stem-pieces were taken from Dunn's Seedling, Rokewood, and Rome Beauty—all commercial varieties displaying considerable resistance to Bitter Pit. Winter Majetin and Cole's Paradise were likewise utilised because they are practically immune from Woolly Blight injuries and their fruits are also reputedly highly resistant to the Bitter Pit.

(5) The fruiting varieties selected for testing on the foregoing rootstocks and stem-pieces were Baldwin, Cleopatra (syn. Ortley of U.S.A.), Cleopatra Q, Esopus Spitzenburg, Jonathan, and Shockley. Of these, Baldwin, Cleopatra, Shockley, and Spitzenburg were all, by general opinion, considered at the time of commencing the trials to be highly susceptible to Bitter Pit. The subvariety Cleopatra Q had not up till that time been known to have borne any fruits affected by that disease, whilst Jonathan was regarded as capable of resisting it to a very high degree. In consequence of this reputation the last-named variety was used in more limited numbers on the various rootstocks and stem-pieces.

(6) There were 7 trees of each of 5 varieties and 1 tree of Jonathan = 36 trees in all, worked and grown direct on Northern Spy rootstocks from 1908 until 1927. During 1929 and 1930, 30 trees, and from 1930-34, 24 still remained in the trials. On Winter Majetin rootstocks from 1910 to 1927, 6 trees—one of each variety—was grown, and from 1928-34, 5 remained intact. On Cole's Paradise rootstocks similar numbers of trees were grown over the same periods as those on the Winter Majetin stocks. The Dunn's Seedling and Rokewood stem-pieces worked on Northern Spy rootstocks each carried 6 trees—1 of each variety—from 1908 to 1934. The Winter Majetin and Cole's Paradise stem-pieces on Northern Spy roots each carried 6 trees, *i.e.*, one of each of the fruiting varieties, from 1911 to 1927, and 5 trees only from 1928 to 1934. The Rome Beauty stem-pieces

on Northern Spy rootstocks consisted of 10 trees = 2 each of 5 varieties (Cleopatra Q being omitted), from 1912 to 1927, and 6 trees = 2 of each of 3 fruiting varieties from 1921-34.

(7) In endeavouring to gauge the varying influences exercised by the different rootstocks and stem-pieces on the development of the trees of the fruiting varieties worked on them, the growths exhibited by these trees when grown directly on the Northern Spy rootstocks have been adopted as a standard for comparison.

(8) Measurements of the girth of rootstock, stem-piece (wherever it was used), and of the tree trunk, together with the mean height and spread of the branch system of each tree grown in the trials, have been collected and an average struck from the figures taken from each. These figures indicate that the use of the Winter Majetin as a direct rootstock consistently reduced every growth dimension of the fruiting variety worked upon it. The Cole's Paradise, on the other hand, has increased the dimensions of the stock and stem, and in general has caused the fruiting variety to stand on even terms in both height and spread with those grown on the Northern Spy stocks.

The intermediate stem-pieces of Dunn's Seedling, Rokewood and Rome Beauty have each enabled or permitted the fruiting varieties worked upon them to attain growth dimensions equal in every respect to their fellows grown on the Northern Spy rootstocks direct.

The stem-pieces of Cole's Paradise and of the Winter Majetin have very appreciably restrained the development of the fruiting varieties in every dimension of stem or limb growth obtained from them.

(9) The data relative to the total fruit production and the percentages of apples affected by Bitter Pit contained therein have been collected from each tree grown in the trials. These data extend over periods ranging from 19 to 23 harvests according to the variations in the ages of the trees in the different trials.

The crop yields from each trial have been presented in tabulated form representing three cropping periods. The first period covers those years when the young vigorous growing trees are entering the cropping stage but producing only a limited number of fruits which are usually of a large, soft, sappy texture. In the second, whilst the quantities of apples are steadily increasing in volume, they are still somewhat lacking in firmness of texture, but definitely improving in that particular as the vigour of shoot-growth is slowly diminishing. The third period is one of fuller crop production, though somewhat alternating owing to the trees settling into that habit as their growth is represented by a considerable slackening in the annual extensions of leaders and laterals wherever the trees are not sharply headed in by winter pruning practices. In other words, the trees have arrived at the stage of normal crop production characteristic of each variety.

The data collected indicates that on trees of normal vigour and largely irrespective of the rootstocks or fruiting varieties concerned the first and second periods cover the years during which the percentages of Bitter Pit affected apples are recorded in increasing numbers. From all of the varieties used in these trials, and on nearly all of the rootstocks and stem-piece combinations the greatest losses from this disease have occurred during the second period, culminating approximately 16 years from the date of planting.

During the third or mature period of tree growth the percentages of diseased apples rapidly declined. The data in Table XII. shows that the 36 trees originally set out on Northern Spy rootstocks were gradually reduced to 24 trees owing to the topgrafting of the others to certain commercial varieties in 1927 and 1929. Between 1912 and 1934 the equivalent of 564 single tree crops were taken from them, representing a total weight of 63,414lbs., of which 13,060lbs. were lost through Bitter Pit. This is equal to 20.60 per cent., or approximately 1lb. to each 4.85lbs. of apples. When compared with the percentages of diseased apples obtained from trees on each of the other rootstocks and stem-piece combinations these figures place the Northern Spy rootstock in an unfavourable perspective. When, however, the data from trees on this stock is drawn from similar numbers of trees of the fruiting varieties, as were used on all the other stocks and stem-pieces, this suspected disadvantage largely disappears.

Calculated from 6 trees on the Spy rootstock and embracing the equivalent of 138 single tree crops between 1912 and 1934, the yield is proportionately increased and the quantity of Bitter Pit affected apples reduced to 13.03 per cent., which is less than that recorded from any of the others excepting from those grown on Dunn's Seedling and Rokewood intermediate stem-pieces. The trees on these two last-named combinations when grown in regular replications and in similar soil in the top row seen in the sketch plan, show a cropping capacity approximately equal to those grown directly on the Spy rootstocks. The 36 trees on Spy rootstocks are distributed throughout four rows in the plot, which embrace all of the direct rootstocks and stem-pieces other than those in the Rome Beauty combination which, as formerly remarked, occupies the richest soil as contained in the fifth and lower outside row.

The percentage of Bitter Pit apples taken from the grand total yielded by all of the varieties consisting of 82 trees, as originally set out in the plot on all of the rootstocks and combinations, was 19.69 per cent. When the produce from the lower outside row carrying the Rome Beauty stem-pieces is omitted, the percentage of diseased fruit rose to 20.28 per cent. from 72 trees.

From the evidence adduced the writer is not disposed to condemn the Northern Spy rootstock as being directly responsible for the losses caused by Bitter Pit disease, as recorded in the fruits of the varieties grown upon it. Its substitution by either the Winter Majetin or Cole's Paradise, in his opinion, received insufficient support from the data presented herein. Whilst neither of the two last-named may, if tested on an increased number of trees approximating to that used of Northern Spy stocks in these trials, increase the number of Bitter Pit affected apples from about 1 in 7.67 to 1 in 4.85 as has been the case with the Spy stocks in this plot, there has been a consistent indication shown herein of another fatal objection to their general adoption either as direct rootstocks or as intermediate stem-pieces. This is, that the paucity of cropping generally displayed by the varieties worked on them when compared with the same sorts grown on Northern Spy stocks direct or on the other kinds or stem-pieces placed upon the Spy rootstocks, would not warrant the use of either of them even if they conferred complete immunity from Bitter Pit upon the fruits of the varieties grafted upon them. In other words, these trials show that, at any rate under conditions of soil and climate such as prevail in the State Orchard at Blackwood in South Australia, the commercial varieties of apple-trees grown on Northern Spy rootstocks or on Dunn's Seedling, Rokewood, or Rome Beauty stem-pieces superimposed upon Northern Spy roots, consistently produced crops, which, after the whole of the Bitter Pit affected apples were eliminated, surpassed in quantity and value the total yields of the same varieties grown on Winter Majetin, or Cole's Paradise rootstocks or stem-pieces.

(10) Although not considered as part of the investigation as outlined herein, the comparative susceptibilities to Bitter Pit of the fruiting varieties used in the trials have been defined from the data, as collected in this plot, over cropping periods extending from 19 to 23 consecutive years. These degrees of susceptibility have been set out in the percentages of Bitter Pit affected fruits recorded from the total produce of each variety grown on all rootstocks and stem-pieces. They are as follows:—Jonathan 3.30 per cent., Esopus Spitzenburg 8.33 per cent., Cleopatra 16.59 per cent., Cleopatra Q (sub-variety) 17.82 per cent., Shockley 24.55 per cent., and Baldwin 33.41 per cent.

(11) The time allotted for the compilation of this portion of the report has not permitted an examination to be made of the percentages of Bitter Pit affected apples contained in each separate grade or size of the fruit which has been recorded from each of the trees grown on the various rootstocks or stem-pieces. Neither has it afforded an opportunity of comparing the varying incidence of the disease with the records of temperatures and rainfall experienced during the growth of the apples throughout the lengthy period of years during which these data have been collected.

The writer regrets, owing to the recent application of an earlier retiring age limit to the S.A. Public Service, he will be unable to pursue this report further. This is accentuated more particularly as the data collected in connection with such long distance experiments conducted in the Blackwood State Orchard in respect to the reactions of fruit trees to applications of fertilisers, forms of tillage, and methods of pruning also contain much which may prove to have an important and direct bearing on the prevalence of Bitter Pit in the apple.

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With this contribution the writer terminates his active connection with the Department of Agriculture and the Blackwood Experiment Orchard, which he initiated in 1908. He desires to express his great appreciation of the much valued assistance rendered by the Orchard Manager (Mr. R. Fowler) and his staff, to Mr. E. W. Pritchard (Agricultural Botanist) for photographic studies, to Mr. P. D. Jeffery for preparing plans, and to Mr. P. F. Supple and Miss Amanda Russell, of the office of the Horticultural Branch, for clerical aid so willingly given. Without such combined assistance the compilation of these portions of the report could not have been undertaken.

TABLE III.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by seven trees of each of five Varieties and three of a Sixth (Jonathan) during Stated Periods in the Development of the Trees.*

ALL TREES WERE GRAFTED ON NORTHERN SPY ROOTSTOCKS.

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per Cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
		BALDWIN.			
1912-17	1	- -	—	—	—
1918-24	7	1,546 9	2,028 15	3,575 8	56·75
1925-28	7 }	3,119 0	506 12	3,625 12	13·98
1929-34	1 }				
Total	–	4,665 9	2,535 11	7,201 4	35·21
		CLEOPATRA.			
1912-17	7	27 0	9 2	36 2	25·26
1918-24	7	4,242 4	1,892 7	6,134 11	30·84
1925-34	7	13,630 0	2,022 8	15,652 8	12·92
Total	—	17,899 4	3,924 1	21,823 5	17 98
		CLEOPATRA Q.			
1912-17	7	136 12	40 11	177 7	22·93
1918-24	7	3,692 5	2,069 9	5,761 14	35·92
1925-34	7	11,687 4	2,160 4	13,847 8	15·60
Total		15,516 5	4,270 8	19,786 13	21·58
		ESOPUS SPITZENBURG.			
1912-17	7	8 9	1 2	9 11	11·61
1918-24	7	1,794 2	578 15	2,373 1	21·87
1925-34	7	5,574 0	171 8	5,745 8	2·98
Total	—	7,376 11	751 9	8,128 4	9·25
		JONATHAN.			
1912-17	1	108 9	4 0	112 9	3·55
1918-24	1	440 5	49 12	490 1	10·15
1925-34	1	1,224 12	13 4	1,238 0	1·07
Total	—	1,773 10	67 0	1,840 10	3·64
		SHOCKLEY.			
1912-17	1	24 10	8 2	32 12	24·81
1918-24	7	1,342 12	1,433 10	2,776 6	51·64
1925-26	7 }	1,755 0	69 12	1,824 12	3·82
1927-34	1 }				
Total	—	3,122 6	1,511 8	4,633 14	32·62

Table IV.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by One Tree of each of Six Varieties during Stated Periods in the Development of the trees.*

ALL TREES WERE GRAFTED ON NORTHERN SPY ROOTSTOCKS.

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
			BALDWIN.		
1912-17	1	—	—	—	—
1918-24	1	355 0	465 9	820 9	56·74
1925-34	1	1,731 0	150 4	1,881 4	7.99
Total	—	2,086 0	615 13	2,701 13	22·79
			CLEOPATRA.		
1912-17	1	27 0	9 2	36 2	25·26
1918-24	1	596 15	125 4	722 3	17·34
1925-34	1	1,565 4	66 12	1,632 0	4·09
Total	-	2,189 3	201 2	2,390 5	8·41
			CLEOPATRA Q.		
1912-17	1	136 12	40 11	177 7	22·93
1918-24	1	1,111 9	449 4	1,560 13	28·78
1925-34	1	2,472 0	92 12	2,564 12	3·62
Total	—	3,720 5	582 11	4,303 0	13·54
			ESOPUS SPITZENBURG.		
1912-17	1	8 9	1 2	9 11	11·61
1918-24	1	334 8	118 5	452 13	26·12
1925-34	1	1,073 12	46 12	1,120 8	4·17
Total	—	1,416 13	166 3	1,583 0	10·50
			JONATHAN.		
1912-17	1	108 9	4 0	112 9	3·55
1918-24	1	440 5	49 12	490 1	10·15
1925-34	1	1,224 12	13- 4	1,238 0	1·07
Total	—	1,773 10	67 0	1,840 10	3·64
			SHOCKLEY.		
1912-17	1	24 10	8 2	32 12	24·81
1918-24	1	188 10	140 8	329 2	42·69
1925-34	1	1,081 0	37 4	1,118 4	3 33
Total		1,294 4	185 14	1,480 2	12 54

TABLE V.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by One tree of each of Six Varieties during Stated Periods in the Development of the Trees.*

ALL TREES ARE GRAFTED ON WINTER MAJETIN ROOTSTOCKS.

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
		BALDWIN.			
1914-17	1	—	—	—	—
1918-27	1	24 4	38 12	63 0	61·51
1928-34	1	662 8	252 4	914 12	31·80
Total	—	686 12	291 0	977 12	29·76
		CLEOPATRA.			
1914-17	1	5 1	0 9	5 10	10·00
1918-27	1	663 1	158 1	821 2	19·25
1928-34	1	877 4	91 12	969 0	9·47
Total	—	1,545 6	250 6	1,795 12	13·94
		CLEOPATRA Q.			
1914-17	1	6 12	—	6 12	—
1918-27	1	548 7	175 13	724 4	24·28
1928-34	1	905 8	56 12	962 4	5·90
Total	—	1,460 11	232 9	1,693 4	13·73
		ESOPUS SPITZENBURG.			
1914-17	1	2 6	0 10	3 0	20·83
1918-27	1	105 4	27 2	132 6	20·50
1928-34	1	309 0	6 4	315 4	1·98
Total	—	416 10	34 0	450 10	7·55
		JONATHAN.			
1914-17	1	—	—	—	—
1918-27	1	284 15	19 6	304 5	6·37
1928-34	1	440 4	1 0	441 4	0·23
Total	—	725 3	20 6	745 9	2·73
		SHOCKLEY.			
1914-17	1	1 13	0 13	2 10	30·95
1918-26	*1	109 3	29 5	139 2	21·07
Total	—	111 0	30 2	141 12	21·25

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* Top-grafted to Granny Smith 1927.

TABLE VI.—*Showing the Total Yields and Percentages of Apples affected by Bitter Pit borne by one Tree of each of six Varieties during Stated Periods in the Development of the Trees.*

ALL TREES GRAFTED ON COLE'S PARADISE ROOTSTOCKS.

Cropping Period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
			BALDWIN.		
1914-17	1	—	—	—	—
1918-27	1	591 8	405 2	996 10	40·65
1928-34	1	1,430 0	340 12	1,770 12	19·24
Total	—	2,021 8	745 14	2,767 6	26·95
			CLEOPATRA.		
1914-17	1	1 5	—	1 5	—
1918-27	1	613 15	111 12	725 11	15·40
1928-34	1	928 12	127 8	1,056 4	12·07
Total	—	1,544 0	239 4	1,783 4	13·42
			CLEOPATRA Q.		
1914-17	1	14 8	3 10	18 2	20·00
1918-27	1	514 15	298 6	813 5	36·69
1928-34	1	1,137 12	49 4	1,187 0	4·15
Total	—	1,667 3	351 4	2,018 7	17·40
			ESOPUS SPITZENBURG.		
1914-17	1	1 13	—	1 13	—
1918-27	1	359 13	67 6	427 3	15·77
1928-34	1	627 12	20 12	648 8	3·20
Total	-	989 6	88 2	1,077 8	8·18
			JONATHAN.		
1914-17	1	18 0	0 8	18 8	2·70
1918-27	1	459 0	37 0	496 0	7·46
1928-34	1	834 0	8 4	842 4	0·98
Total	—	1,311 0	45 12	1,356 12	3·37
			SHOCKLEY.		
1914-17	1	3 9	1 15	5 8	35·23
1918-26	*1	431 14	197 9	629 7	31·39
Total	—	435 7	199 8	634 15	31·42

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[*] Top-grafted to Granny Smith, 1927.

TABLE VII.—*Showing the Total Yields and Percentages of Apples affected by Bitter Pit borne by One Tree of each of Six Varieties during stated periods in the Development of the Trees when worked on—*

INTERMEDIATE STEMPIECES OF DUNN'S SEEDLING GROWN ON NORTHERN SPY ROOTSTOCKS.

Cropping Period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
		BALDWIN.			
1912-17	1	13 3	6 3	19 6	31·93
1918-24	1	125 12	140 13	266 9	52·83
1925-34	1	123 12	90 0	213 12	42·11
Total		262 11	237 0	499 11	47·43
		CLEOPATRA.			
1912-17	1	72 2	8 1	80 3	10·05
1918-24	1	658 9	83 8	742 1	11·25
1925-34	1	1,209 12	36 4	1,246 0	2·91
Total		1,940 7	127 13	2,068 4	6·18
		CLEOPATRA Q.			
1912-17	1	32 13	8 7	41 4	20·45
1918-24	1	813 5	209 15	1,023 4	20·52
1925-34	1	1,667 4	53 12	1,721 0	3·12
Total		2,513 6	272 2	2,785 8	9·77
		ESOPUS SPITZENBURG.			
1912-17	1	65 0	5 7	70 7	7·72
1918-24	1	749 1	191 0	940 1	20·32
1925-34	1	1,270 4	24 4	1,294 8	1·87
Total		2,084 5	220 11	2,305 0	9·57
		JONATHAN.			
1912-17	1	73 3	4 4	77 7	5·24
1918-24	1	355 4	53 0	408 4	12·98
1925-34	1	1,031 8	10 8	1,042 0	1·00
Total		1,459 15	67 12	1,527 11	4·43
		SHOCKLEY.			
1912-17	1	153 12	24 14	178 10	13·92
1918-24	1	425 5	302 14	728 3	41·59
1925-34	1	1,952 8	93 8	2,046 0	4·57
Total		2,531 9	421 4	2,952 13	14·27

TABLE VIII.—*Showing the Total Yields and Percentages of Apples affected by Bitter Pit, borne by One Tree of each of Six Varieties during stated periods in the Development of the Trees when worked on—*

INTERMEDIATE STEMPIECES OF ROKEWOOD GROWN ON NORTHERN SPY ROOTSTOCKS.

Cropping Period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
			BALDWIN.		
1912-17	1	1 6	1 0	2 6	42·10
1918-24	1	350 14	374 7	725 5	51·62
1925-34	1	1,379 12	205 4	1,585 0	12·95
Total		1,732 0	580 11	2,312 11	25·11
			CLEOPATRA.		
1912-17	1	53 5	6 1	59 6	10·39
1918-24	1	641 5	71 9	712 14	10·04
1925-34	1	1,270 4	31 12	1,302 0	2·44
Total		1,964 14	109 6	2,074 4	5·27
			CLEOPATRA Q.		
1912-17	1	101 11	23 7	125 2	18·73
1918-24	1	897 10	226 7	1,124 1	20·14
1925-34	1	1,691 8	88 4	1,779 12	4·96
Total		2,690 13	338 2	3,028 15	11·16
			ESOPUS SPITZENBURG.		
1912-17	1	62 14	4 12	67 10	7·02
1918-24	1	881 1	173 6	1,054 7	16·44
1925-34	1	1,734 4	56 12	1,791 0	3·17
Total		2,678 3	234 14	2,913 1	8·06
			JONATHAN.		
1912-17	1	72 1	3 4	75 5	4·06
1918-24	1	258 11	44 2	302 13	14·57
1925-34	1	1,068 12	11 8	1,080 4	10·64
Total		1,399 8	58 14	1,458 6	4·04
			SHOCKLEY.		
1912-17	1	138 8	25 6	163 14	2·13
1918-24	1	435 13	329 5	765 2	43·04
1925-34	1	2,136 12	112 8	2,249 4	5·00
Total		2,711 1	467 3	3,178 4	14·70

TABLE IX.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by One Tree of each of Six Varieties during Stated Periods in the Development of the Trees when worked on—*

INTERMEDIATE STEMPIECES OF COLE'S PARADISE GROWN ON NORTHERN SPY ROOTSTOCKS.

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
		BALDWIN.			
1914-17	1	—	0 13	0 13	100·00
1918-27	1	150 11	110 3	260 14	42·24
1928-34	1	401 0	189 12	590 12	32·12
Total	—	551 11	300 12	852 7	35·28
		CLEOPATRA.			
1914-17	1	17 5	4 15	22 4	22·19
1918-27	1	202 1	20 9	222 10	9·24
1928-34	1	188 0	27 4	215 4	12·56
Total	—	407 6	52 12	460 2	11·46
		CLEOPATRA Q.			
1914-17	1	11 5	1 4	12 9	9·95
1918-27	1	749 2	84 9	833 11	10·14
1928-34	1	848 4	44 4	892 8	4·96
Total	—	1,608 11	130 1	1,738 12	7·48
		ESOPUS SPITZENBURG.			
1914-17	1	0 5	—	0 5	—
1918-27	1	65 4	2 12	68 0	4·04
1928-34	1	299 4	4 8	303 12	1·47
Total	—	364 13	7 4	372 1	1·95
		JONATHAN.			
1914-17	1	7 3	—	7 3	—
1918-27	1	269 5	22 4	291 9	7·63
1928-34	1	250 12	3 12	254 8	1·47
Total	1	527 4	26 0	553 4	4·70
		SHOCKLEY.			
1914-17	1	6 1	4 12	10 13	43·93
1918-27	1	499 6	212 4	711 10	29·83
1928-34	*1	—	—	—	—
Total	—	505 7	217 0	722 7	30·04

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* Top-grafted to Granny Smith, 1927.

Table X.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by One Tree of each of Six Varieties during Stated Periods in the Development of the Trees when worked on—*

INTERMEDIATE STEMPIECES OF WINTER MAJETIN GROWN ON NORTHERN SPY ROOTSTOCKS.

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
		BALDWIN.			
1914-17	1	—	—	—	-
1918-27	1	229 12	54 4	284 0	19·10
1928-34	1	217 8	156 0	373 8	41·77
Total	—	447 4	210 4	657 8	31·98
		CLEOPATRA.			
1914-17	1	—	—	—	—
1918-27	1	100 12	64 0	164 12	38·85
1928-34	1	783 12	55 4	839 0	6·59
Total	—	884 8	119 4	1,003 12	11·88
		CLEOPATRA Q.			
1914-17	1	5 12	—	5 12	—
1918-27	1	463 0	149 10	612 10	24·42
1928-34	1	709 0	32 4	741 4	4·35
Total	—	1,177 12	181 14	1,359 10	13·38
		ESOPUS SPITZENBURG.			
1914-17	1	—	0 5	0 5	100·00
1918-27	1	154 11	50 14	205 9	24·75
1928-34	1	358 4	13 4	371 8	3·57
Total	—	512 15	64 0	577 6	11.16
		JONATHAN.			
1914-17	1	3 11	—	3 11	—
1918-27	1	106 15	9 0	115 15	7·76
1928-34	1	160 8	1 0	161 8	0·62
Total	—	271 2	10 0	281 2	3·56
		SHOCKLEY.			
1914-17	1	6 7	2 13	9 4	30·40
1918-27	1	302 5	136 10	438 15	31·13
1928-34	*1	—	—	—	—
Total	—	308 12	139 7	448 3	31·11

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* Top-grafted to Granny Smith, 1927.

Table XI.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by Two Trees of each of Five Varieties during Stated Periods in the Development of the Trees, when worked on*—

INTERMEDIATE STEMPIECES OF ROME BEAUTY GROWN ON NORTHERN SPY ROOTSTOCKS.

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.	
		BALDWIN.			
1915-17	2	2 8	0 4	2 12	9·09
1918-28	*2	615 6	784 11	1,400 1	56·05
Total	—	617 14	784 15	1,402 13	55·95
		CLEOPATRA.			
1915-17	2	5 14	—	5 14	—
1918-27	2	869 15	566 15	1,436 14	39·46
1928-34	2	3,455 0	680 4	4,135 4	16·45
Total	—	4,330 13	1,247 3	5,578 0	22·36
		ESOPUS SPITZENBURG.			
1915-17	2	15 8	—	15 8	—
1918-27	2	764 5	190 1	954 6	19·91
1928-34	2	3,345 8	93 12	3,439 4	2·73
Total	—	4,125 5	283 13	4,409 2	6·44
		JONATHAN.			
1915-17	2	2 3	—	2 3	—
1918-27	2	998 13	65 1	1,063 14	6·12
1928-34	2	3,712 8	54 8	3,767 0	1·45
Total	—	4,713 8	119 9	4,833 1	2·47
		SHOCKLEY.			
1915-17	2	1 5	1 0	2 5	43·24
1918-28	2†	505 0	342 0	847 0	40·38
Total	—	506 5	343 0	849 5	40·39

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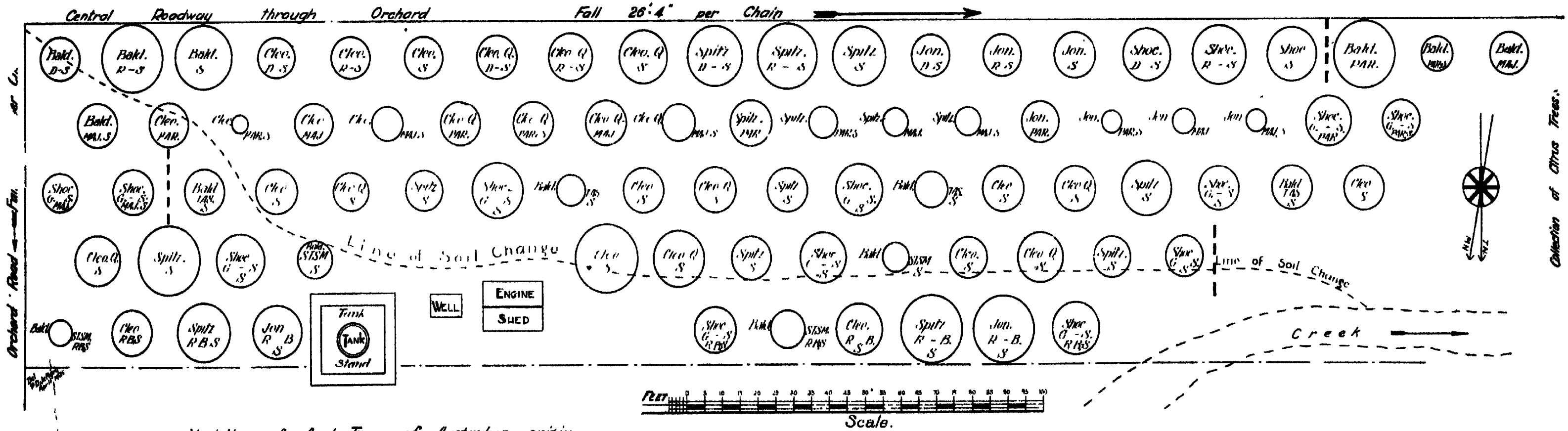
* Two Trees topgrafted to Statesman, 1929.

† Two Trees topgrafted to Granny Smith, 1927.

Sketch Plan "*Bitter Pit*" 'Rootstock Trial Plot—showing mean spread of each tree.



Varieties of Apple Trees of Australian origin.

TABLE XII.—*Summary showing the Total Yields and Percentages of Apples Affected by Bitter Pit produced from Five to 36 Trees consisting of Six Varieties—GROWN ON NORTHERN SPY, WINTER MAJETIN, AND COLE'S BLIGHTPROOF PARADISE ROOTSTOCKS RESPECTIVELY. Similar data is also given from trees of the same Varieties when grown on—INTERMEDIATE STEMPIECES OF DUNN'S SEEDLING, ROKEWOOD, WINTER MAJETIN, COLE'S PARADISE, AND ROME BEAUTY, PREVIOUSLY GRAFTED ON NORTHERN SPY ROOTSTOCKS.*

Cropping period.	No. of Trees.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Affected by Bitter Pit.	Average annual yield per Tree.
		lbs. ozs.	lbs. ozs.	lbs. ozs.		lbs.
ON NORTHERN SPY ROOTSTOCKS.						
1912-26	*36	—	—	—	—	—
1927-29	†30	50,353 13	13,060 5	63,414 2	20·60	112·44
1930-34	24	—	—	—	—	—
1912-34	6	13,016 11	858 7	13,875 2	13·03	100·54
ON WINTER MAJETIN ROOTSTOCKS.						
1914-27 .... 1928-34	*6 5	4,945 10	859 1	5,804 11	14·80	55·81
ON PARADISE ROOTSTOCKS (COLE'S BLIGHTPROOF).						
1914-27 .... 1928-34	*6 5	7,974 8	1,663 12	9,638 4	17·26	83·08
INTERMEDIATE STEMPIECES GRAFTED ON NORTHERN SPY ROOTSTOCKS						
ON DUNN'S SEEDLING STEMPIECES.						
1912 to 1934	6	10,792 5	1,346 10	12,138 15	11·09	87·96
ON ROKEWOOD STEMPIECES.						
1912 to 1934	6	13,176 7	1,789 2	14,965 9	11·95	108·45
ON WINTER MAJETIN STEMPIECES.						
1914-27 .... 1928-34	*6 5	3,602 5	725 4	4,327 9	16·76	44·62
ON PARADISE STEMPIECES.						
1914-27 .... 1928-34	*6 5	3,965 4	733 13	4,699 1	15·62	41·58
ON ROME BEAUTY STEMPIECES.						
1915-27 .... 1929-34	‡10 *6	14,293 13	2,778 7	17,072 4	16·27	105·38

* Twelve trees of Shockley in all sections were top-grafted to Granny Smith in 1927.

† Four trees of Baldwin in all sections were top-grafted to Tasma, 1929.

‡ Four trees of Baldwin in all sections were top-grafted to Statesman, 1929.

TABLE XIII.—*Showing the Total Yields and Percentages of Apples affected by Bitter Pit, borne by each of Six Varieties grown on THREE DIFFERENT ROOTSTOCKS OVER STATED CROPPING PERIODS.*

Number of trees and Cropping Periods—	1912-27 = 36 trees. 1928-29 = 30 trees. 1930-34 = 24 trees.				1914-27 = 6 trees. 1928-34 = 5 trees.				1914-27 = 6 trees. 1928-34 = 5 trees.			
Rootstocks.	Northern Spy.				Winter Majetin.				Paradise (Cole's Blightproof.)			
Variety.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per Cent. Bitter Pit.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per Cent. Bitter Pit.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per Cent. Bitter Pit.
	lbs. ozs.	lbs. ozs.	lbs. ozs.	%	lbs. ozs.	lbs. ozs.	lbs. ozs.	%	lbs. ozs.	lbs. ozs.	lbs. ozs.	%
Baldwin ...	4,665 9	2,535 11	7,201 4	*35·21	686 12	291 0	977 12	22 76	2,021 8	745 14	2,767 6	26·95
Cleopatra ..	17,899 4	3,924 1	21,823 5	17·98	1,545 6	250 6	1,795 12	13·94	1,544 0	239 4	1,783 4	13·42
Cleopatra Q.	15,516 5	4,270 8	19,786 13	21·58	1,460 11	232 9	1,693 4	13·73	1,667 3	351 4	2,018 7	17·40
Esopus Spitzenburg	7,376 11	751 9	8,128 4	9 25	416 10	34 0	450 10	7·55	989 6	88 2	1,077 8	8·18
Jonathan ..	1,773 10	67 0	1,840 10	‡3·64	725 3	20 6	745 9	2·73	1,311 0	45 12	1,356 12	3·37
Shockley ..	3,122 6	1,511 8	4,633 14	*32·62	111 0	30 12	141 12	¶21·25	435 7	199 8	634 15	§31·42
Total Yields and percentages of Bitter Pit .	50,353 13	13,060 5	63,414 2	20 60	4,945 10	859 1	5,804 11	14·80	5,968 8	1,669 12	7,638 4	21·86

* Four trees of Baldwin top-worked to Tasma in 1929; two trees of Baldwin top-worked to Statesman in 1929.

† Six trees of Shockley top-worked to Granny Smith in 1927. ‡ One tree only of Jonathan in the trial.

¶ One tree of Shockley top-worked to Granny Smith in 1927. § One tree of Shockley top-worked to Granny Smith in 1927.

TABLE XIV.—*Showing the Total Yields and Percentages of Apples affected by Bitter Pit borne by each of Six Varieties when grown on FIVE DIFFERENT INTERMEDIATE STEMPIECES established on NORTHERN SPY ROOTSTOCKS.*

Variety.	Intermediate Stempieces.	1912-34 = 6 trees.				1912-34 = 6 trees.				1914-27 = 6 trees, 1928-34 = 5 trees.			
		Dunn's Seedling.				Rokewood.				Paradise (Cole's).			
	No. of Trees on each Stempiece.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.		lbs. ozs.	lbs. ozs.	lbs. ozs.		lbs. ozs.	lbs. ozs.	lbs. ozs.	
Baldwin ..	1	262 11	237 0	499 11	47·43	1,732 0	580 11	2,312 11	25·11	551 11	300 12	852 7	35·28
Cleopatra .	1	1,940 7	127 13	2,068 4	6·18	1,964 14	109 6	2,074 4	5·27	407 6	52 12	460 2	11·46
Cleopatra Q	1	2,513 6	272 2	2,785 8	9·77	2,690 13	338 2	3,028 15	11·16	1,608 11	130 1	1,738 12	7·48
Esopus Spitzenburg	1	2,084 5	220 11	2,305 0	9·57	2,678 3	234 14	2,913 1	8·06	364 13	7 4	372 1	1·95
Jonathan .	1	1,459 15	67 12	1,527 11	4·43	1,399 8	58 14	1,458 6	4·04	527 4	26 0	553 4	4·70
Shockley ..	1	2,531 9	421 4	2,952 13	14·27	2,711 1	467 3	3,178 4	14·70	505 7	217 0	722 7*	30·04
Total yields of six trees and percentages of crops affected by Bitter Pit ..		10,792 5	1,346 10	12,138 15	11·09	13,176 7	1,789 2	14,965 9	11·95	3,965 4	733 13	4,699 1	15·62

TABLE XIV.—*Showing the Total Yields and Percentages of Apples affected by Bitter Pit borne by each of Six Varieties when grown on FIVE DIFFERENT INTERMEDIATE STEMPIECES established on NORTHERN SPY ROOTSTOCKS*.—continued.

Variety.	Intermediate Stempieces.	1914-27 = 6 trees, 1928-34 = 5 trees.				1915-28 = 10 trees, 1929-34 = 6 trees.			
		Winter Majetin.				Rome Beauty.			
	No. of Trees on each Stempiece.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.
		lbs. ozs.	lbs. ozs.	lbs. ozs.		lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
Baldwin	1	447 4	210 4	657 8	31·98	617 14	784 15	1,402 13†	55·95
Cleopatra	1	884 8	119 4	1,003 12	11·88	4,330 13	1,247 3	5,578 0	22·36
Cleopatra Q.	1	1,177 12	181 14	1,359 10	13·38	—	—	—	—
Esopus Spitzenburg	1	512 15	64 7	577 6	11·16	4,125 5	283 13	4,409 2	6·44
Jonathan	1	271 2	10 0	281 2	3·56	4,713 8	119 8	4,833 0	2·47
Shockley	1	308 12	139 7	448 3*	31·11	506 5	343 0	849 5‡	40·39
Total yields of six trees and percentages of crops affected by Bitter Pit..................	—	3,602 5	725 4	4,327 9	16·76	14,293 13	2,778 7	17,072 4	16·27

* One tree of Shockley topworked to Granny Smith in 1927.
† Two trees of Baldwin topworked to Statesman in 1929.
‡ Two trees of Shockley topworked to Granny Smith in 1927.

TABLE XV.—*Showing the Total Yields and Percentages of Apples Affected by Bitter Pit borne by TWELVE TREES OF GRANNY SMITH Variety topgrafted in* 1927 *on MATURE TREES OF SHOCKLEY and FOUR TREES EACH OF TASMA AND STATESMAN Varieties topgrafted in* 1929 *on BALDWIN.*

The Periods of Cropping of these topgrafted Varieties together with the Rootstocks and Stempieces on which the original Shockley and Baldwin Trees grew are stated in the Table.

Cropping Period.	No. of Trees.	Top worked in 1927 on mature of trees Shockley growing on Northern Spy Rootstocks.	Free from Bitter Pit.	Affected by Bitter Pit.	Total Crop.	Per cent. Bitter Pit.	Average Annual Yield per Tree.
			lbs.	lbs.	lbs.		
		GRANNY SMITH.					
1929-34	6	Topworked on Shockley on Northern Spy Rootstocks	4,792 0	53 0	4,845 0	1·09	134·58
1929-34	1	Topworked on Shockley on Cole's Paradise Rootstocks	849 0	14 0	863 0	1·62	143·83
1929-34	1	Topworked on Shockley on Winter Majetin	81 8	3 12	85 4	4·40	14·33
1929-34	1	Topworked on Shockley on Cole's Paradise Stempiece on Northern Spy Rootstocks	903 4	4 8	907 12	0·50	151·46
1929-34	1	Topworked on Shockley on Winter Majetin Stempiece on Northern Spy Rootstocks	432 8	8 8	441 0	1·93	73·50
1929-34	2	Topworked on Shockley on Rome Beauty Stempiece on Northern Spy Rootstocks	1,567 12	37 0	1,604 12	2·30	133·11
		Total	8,626 0	120 12	8,746 12	1·38	—
		TASMA (DEMOCRAT).					
1933-34	4	Topworked on Baldwin on Northern Spy Rootstocks	822 0	12 8	834 8	1·50	104·50
		STATESMAN.					
1933-34	2	Topworked on Baldwin on Northern Spy Rootstocks	320 0	—	320 0	—	80·00
1933-34	2	Topworked on Baldwin on Rome Beauty Stempieces on Northern Spy Rootstocks	347 8	1 8	349 0	0·43	87·25
		Total	667 8	1 8	669 0	0·02	—

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE OF SOUTHERN BRANCHES.

With an excellent attendance of delegates from Finniss, Strathalbyn, Port Elliot, Echunga, Yundi, Currency Creek, Aldinga, Inman Valley, Hope Forest, Belvidere, Hartley, and Mount Compass, Branches of the Agricultural Bureau in the Southern districts held their first Conference at Mount Compass on 15th August. Mr. A. S. Kidman presided, the Department of Agriculture being represented by Messrs. A. L. McEwin, M.L.C. (Chairman Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), R. C. Scott (Supervisor of Experimental Work), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Poultry Expert), R. Hill, H. J. Apps, and H. H. Orchard (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary).

Mr. R. H. Martin (member Advisory Board of Agriculture), in declaring the Conference open, expressed pleasure at the interest that settlers in the Southern districts were taking in the work of the Agricultural Bureau, which was evidenced by the particularly fine attendance at the opening session. He recalled the fact that some years ago the country in the vicinity of Mount Compass was regarded as some of the most hopeless in South Australia, but since that time the country had taken on an entirely different aspect. With the clearing of the land, the application of intelligent methods and fertilisers, the country had been brought to a high state of productivity. The remarkable figures put up by the dairy herds of Messrs. C. Verco and H. B. Peters, and the outstanding success achieved in the raising of sheep and fat lambs by Messrs. A. S. Kidman and C. Simpson, were sufficient answer to those who doubted the agricultural future of the districts represented by the Conference.

Delegates at the Southern Conference, Mount Compass, 15th August, 1935.

During the discussion on a paper, "Experiences in Clearing Scrub in the Mount Compass District," read by Mr. H. J. Sneyd (Mount Compass), the Hon. A. L. McEwin, who was speaking at a Conference for the first time in his official capacity of Chairman of the Advisory Board, congratulated Mr. Sneyd on writing an excellent paper. He made special reference to the final paragraph of Mr. Sneyd's paper which read as follows:—"I would like to remark on the wonderful way in which the older established settlers go out of their way to assist any newcomer who goes to them for advice. Things are pointed out, and it must have saved many new settlers pounds and pounds, besides stopping them starting on wrong lines.'' ''That,'' said Mr. McEwin, ''expressed in a few words the sentiment underlying the Agricultural Bureau.'' From the discussion that followed the reading of the paper, he was pleased to learn that settlers appreciated the services and advice given by the officers of the Department of Agriculture. Very little was spent on agricultural education in South Australia, less than any of the other States, and that, he considered, was a condition which should not exist in a State which was so dependent on primary production. The best way to increase those services was by expressions of appreciation, such as had been given in the dicussion of the paper.

Other papers were read as follows:—''Making the Most of a Small Holding,'' W. F. Roads (Inman Valley); ''Trees for Shelter and Timber,'' J. W. Crompton (Port Elliot); ''Control of Noxious Weeds,'' F. C. Keen (Port Elliot); ''How to Make Farming Pay,'' H. A. Eckert (Belvidere).

Departmental officers took part in the discussion following the reading of the papers, and the following resolutions were carried:—''That the 1936 Conference be held at Inman Valley''; ''that the Advisory Board be asked to request the combined Governments of the Commonwealth to unite in an endeavour to publish a Noxious Weeds Reference Book for the use of Education Departments of all States of the Commonwealth, and that this resolution be included on the Congress agenda.''

On the motion of Mr. J. Hudd (Hartley), seconded by Mr. W. Muldoon (Hope Forest), it was decided to ask the Government to retain Mr. R. Hill as the district agricultural instructor for the Southern districts. The resolution was supported by Messrs. J. Bice (Echunga), C. Bevan (Hope Forest), A. S. Kidman (Mount Compass), and carried unanimously.

Conference concluded with an address on his visit to Argentine, South Africa, and New Zealand, by Mr. W. J. Spafford.

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PAPERS READ AT CONFERENCES.

MURRAY LANDS WEST, KAROONDA, 6th AUGUST, 1935.

IS THE FARMER AN ASSET OR A LIABILITY TO THE COMMUNITY?

[E. L. COWLED, Borrika.]

The idea that the farmer can no longer be looked upon as the backbone of the country seems to be gaining ground, because in recent years the Commonwealth Government has set up a new department to administer and control many farmers' affairs; and it is thought that it is the community which is supporting the farmer, instead of the farmer supporting the community.

What does an average farmer produce in real wealth that is needed by the community? An average farmer can be taken as one who grows 1,000 bags of wheat each year, runs a flock of 200 sheep, from which he produces 150 lambs and cuts 2,000lbs. of wool at 10lbs. per sheep. He also runs 100 head of poultry, from which he gets 800doz. eggs, and keeps three cows, from which he makes 500lbs. of butter to sell. These figures may not be quite accurate, but for the purpose of this paper very near the average farmer's production.

How many people does this one farmer provide with the necessities of life (food and clothing)? The average consumption of bread for each person for one year is estimated to take 5bush. of wheat; therefore, this farmer provides the staff of life for 600 people for one year. The 150 lambs produced at an average weight of 32lbs. each total 4,800lbs., allowing 4lbs. per person per week, this will keep 22 people in meat for one year. The 2,000lbs. of greasy wool is equal to 1,000lbs. of clean wool and by making half that quantity into men's suits and half into blankets (6lbs. of wool to make a suit and 7lbs. a double blanket), material is manufactured for 83 men's suits and 71 double blankets. The butter produced from the cows would give 1lb. butter to 10 people for one year; and the 800doz. eggs would enable 52 people to have 1 egg for breakfast each day for 1 year. Thus this farmer supplies directly a large number of people with food and clothing.

Some of the indirect benefits are, first, there is the labour employed in the transport of his goods to the consumer; the machinery to be made and used and the labour employed in the making of his wheat into flour and bread, his wool into clothing, &c. Add to this, the making of machinery he requires to produce this wealth, the manufacture and transport of his super, cornsacks, fencing material, and the thousand and one things required on the farm. Can it be doubted that each farmer is a very real asset, and each one that goes out of production means a substantial reduction in the real wealth of the community?

One would naturally conclude that anyone producing so much that the community needed would at least get sufficient monetary return in exchange for it to pay the cost of production, and for him and his family to live in comfort, to educate his family, and make some profits to put by for an adverse season. But that such is not the case is proved by the huge sum of farmers' debts, the need of bounties and Farmers Assistance Boards, and Debt Adjustment Boards. And because the community takes all this wealth and hands back so little in money to the farmer in exchange, and he is unable to pay his way, he is told he is no longer the backbone of the country, and is looked upon by many as a liability.

The purpose of this paper is to show that he still is, and always must be, not a liability but a very real asset.

[Papers Read at Conferences.]

SOME EXPERIENCES WITH FRUITGROWING IN THE MURRAY MALLEE.

[W. R. Trestrail, Coomandook.]

Fruit can be successfully grown in the mallee in a 15in. rainfall without irrigation. I planted a small fruit garden a number of years ago, and have grown good fruit of the following kinds:—Apples, apricots, pears, and figs. Plums and peaches can be considered, but have not done so well as the first-mentioned fruits. In selecting a site for a garden, choose if possible a sandy rise, with a good clay subsoil.

If finances permit, net in the garden to save damage from rabbits, hares, and possibly sheep or pigs. If the trees should be attacked, and the bark eaten off or in any way seriously damaged, bind the tree with wet clay and tie bagging around the clay. A good way to protect the trees is to whitewash the trunks, adding a little horse or cow manure to make it more effective in sticking to the tree.

When laying out the garden, plant a breakwind of trees around the outside. Sugar gums are good, but pines are better, either the Aleppo or Stone Pines. Almond trees could be also considered, as they will show a profit if the right kind are planted.

The trees should be planted in June or July, when the subsoil is thoroughly wet. Plough the ground in strips about 8ft. to 10ft. wide, to leave a strip that will counteract the drift in the summer. Prepare the holes about 1yd. square and about 2ft. deep. Loosen the bottom well and mix about a kerosene bucketful of old stable manure. Superphosphpate is not suitable for fruit trees. Do not plant the trees too close, 24ft. should be ample. The following varieties can be recommended:—Apples: Cleopatra, Glengyle Red, Gravenstein, Jonathan, Rome Beauty, and Granny Smith. Apricots: Riverside and Moorpark. Pears: Clapp's Favourite, Duchess, Packham's Triumph, and Howell. Figs: White Turkey and White Genoa.

Nectarines may be raised direct from seedlings, and figs and mulberries planted from cuttings. Vines could be planted near the house and trellised. Good returns have been obtained from Sultanas and Black Prince. Others should also do well. These can be planted from cuttings.

The trees should be pruned in July, keeping the middle thinned out to let the light into the centre of the tree. The ground should be ploughed in strips about the end of August or before the middle of September to check the drift sand.

If a bore of good water is convenient, the garden can be irrigated. A small garden is a useful hobby, as well as a saving in cash in the purchasing of fruit.

MY METHOD OF CROPPING.

[J. Buller, Yurgo.]

After having tried several ways of cropping, I find that four years' rotation, fallow, wheat or oats, grazing, and grazing, is the best. Providing there is a good stand of Wimmera Rye Grass, which is not overrun with useless plants or bushes, and if there is little or no grazing owing to the growth of useless plants and bush, then a three-years' rotation is best. Wimmera Rye Grass is not subject to take-all, so that it helps to control the ravages of this disease, and reduces the loss to a minimum.

Before fallowing, graze the paddock as much as possible with sheep. See that the plough is in good order, and do not put the horses on to fallowing as soon as seeding is finished. Give them at least a week's rest and stable feed them during that time. Any type of plough will do for fallowing, providing that it will do a good job. This year I am using the disc plough, ploughing 2in. to 3in. deep. If it is wet, and the work is being done fairly early, I plough 3in. to 4in., but lessen the depth toward the end.

Fallow as early as possible for the following reasons:—A greater storage of soil water, increased supply of air, a better seed bed; soil bacteria are more active during wet weather, and more plant food is made available for the coming crop.

Next comes harrowing, which is done across the ploughing, with harrows fitted with patent points or shares. These cultivate, help to kill weeds, break up any lumps, and assist in the control of drift, by leaving the surface ridged. Harrowing is not done again unless at least ½in. of rain falls in October or during harvest, then as much land as possible is gone over and the work stopped as soon as dust starts to rise.

Autumn is the next working, and if blessed with more than ½in. of rain, harrows are worked the next day. Do not wait for it to stop raining, but be sure to again go over the piece which received the first working, because the weeds will have started to grow.

SEEDING OPERATIONS.

As a rule oats are sown about the second or third week in April, but before doing so see that the drill is in perfect order. Pay particular attention to the boots and scrapers, for it is very important that the seed should fall on the seed bed before any dry sand or loose soil

For oats for hay, the early varieties such as Early Kherson, Mulga, &c., are favoured, and late varieties for grain, Algerian, Guyra, &c. They cover the ground quickly, which helps control the drift. The early varieties of oats can be cut and in the stack before the wheat is ready for reaping. Often with the late varieties the hay has to be left out until after reaping, and loses a lot of its feeding value.

Before drilling, cultivate with harrows with points on, and double harrow wherever necessary. If cultivating with harrows fitted with patent points, they may appear to be doing a good job, but in some places they make an uneven seed bed. This is the reason for double harrowing. I also harrow after drilling. For oats, sow about 50lbs. of seed and 90lbs. of super, 45 per cent. Start sowing on the 1st of May, using a late variety. The land is again cultivated with harrows with points on, and the work continued until the weeds are too big for the harrows to deal with; then the cultivator is started. I sow from 45lbs. to 60lbs. of seed and as much super as finances will allow. This year I sowed 105lbs. The seed is all recleaned before sowing and pickled with copper carbonate.

BIRDS AND THEIR VALUE TO THE MAN ON THE LAND.

[M. F. BALLARD, Coomandook.]

Quite a number of men realise the value of birds in controlling pests of various kinds, but there are those who cannot see any good in any of them.

Birds that come under the heading of meat eaters include eagles, hawks, crows, &c. They are usually shot on sight or destroyed in some way. Most farmers have to take steps to destroy rabbits, and the dead rabbits are left lying about to become breeding grounds for blowflies. These millions of flies would do untold damage if it were not for the fact that large numbers of the maggots are destroyed by crows, &c. The crows do an enormous amount of good in clearing up dead carcasses, and if they do kill a sheep now and again, it is usually because that sheep is too weak to get up. The crow does more good than the blowfly does harm. The same applies to eagles. One not infrequently sees eagles' nests with the bones of innumerable rabbits lying under them. Those birds also dispose of a lot of carrion.

Crows, choughs, magpies, and all other strong-billed birds also account for huge numbers of grasshoppers, and after the last visit from those pests landholders should be more careful of the birds that they destroy. It is easy enough to destroy the birds, but then the countless thousands of insect pests they used to keep in check will overrun the country.

Another class of meat eaters, those which destroy insects and grubs, perform a very valuable work. They dispose of millions of insects that, if allowed to breed unmolested for a few months, would be a menace to the community.

The starling—an imported bird—does some damage, too; but these birds were responsible for killing thousands of grasshoppers last year.

The seed eaters include pigeons, quails, sparrows, &c. The pigeons will eat wheat when they get a chance, and sparrows are a nuisance when they build nests in the roof of the house or sheds and in implements, but there is nothing else that they do that can be counted as bad. On the other side of the ledger is the fact that they like small seeds, and eat numbers of weed seeds that would otherwise be a pest. An examination of the crops of a few pigeons showed that there was hardly ever any wheat or oats in them, but mostly the smaller seeds of weeds such as clovers, stinkwort, turnip, &c.

Quails hardly ever worry crops, but live almost entirely on weed seeds and grubs. The study of birds is an absorbing one, and if every farmer went to the trouble, he would soon find out just how valuable an ally they are to him.

Leave patches of scrub so that the birds may find sanctuary and breed there. Farmers will be more than repaid for the few acres of scrub, by the amount of good the birds will do

THE HORSE ON THE FARM.

[G. SUTHERLAND, Copeville.]

On a large proportion of farms, the horse is the most neglected unit. He does not get half the care and attention that he is entitled to.

It does not matter what the team is like, so long as the animals are evenly matched. Do not keep a horse that is slow and a "pointer"; he is only an annoyance to the driver and the rest of the team.

Feeding.—This is the part of horse management which is most neglected. On numbers of farms there can be seen a yard with feeders around it. On others, a shed with a manger in it, and ten or perhaps fifteen or more horses are turned loose into it, with the result that the "boss" takes up enough room for three or four horses, and the timid horse stands back, and perhaps gets his feed after the others have finished.

It is much better to tie up each horse, then the teamster knows just how much each horse is getting, and if one horse has not eaten his breakfast, it is very noticeable, and can be treated accordingly, while with the loose feeding method it is quite easy for a horse not to have eaten his feed, and be overlooked. He is taken out to the paddock and is later found to be unfit for work, resulting in much loss of time.

The proper way to keep horses is to have a stable—a straw one will do—with a stall for each horse; and tie up each horse, also a peg in the post alongside his head to take collars, hames, and winkers.

There are two wrong ways of feeding horses. The man who underfeeds, and the man who tips in too much at a time. I recommend feeding four times a day and then giving each horse as much as he will clean up, and no more with supper the heaviest feed.

After feeding a team for three or four days, one can judge how much the horses will eat fairly accurately. There is no need to mention what happens to the team that is underfed. The man who tips in too much feed, will not get the best results from his horses or feed. At the next feeding time go to the feeder and pick up a handful of feed which was left over and smell it, it is tainted and sour after the breathing and nosing about by the horses.

I am a firm believer in feeding plenty of oats, in fact, I do not think horses can be given too many oats, provided it is worked up to them gradually and they are working heavily. When working, feed on good hay, chaffed oaten for preference—with three horses to a kerosene tin of crushed oats. Sometimes give more or less according to the work, that is, for breakfast and tea—no oats for the night feed.

When feeding nosebags in the paddock for dinner give mostly all oats and between six or seven double handsful to each horse. They do not take long to eat it, and the horses are better for it as they are not overful.

Grooming and Clipping.—Besides making him feel and look better, there is no better time than when grooming in the morning, to find out if the horse has any tender spots on the shoulders, for by paying attention when grooming it will be noticed that he eases away from the brush if there is any soreness.

While speaking of grooming, one cannot pass over the importance of clipping horses in the Autumn. When I first came to South Australia, I was amazed to notice that no one clipped their horses, and when I did clip mine, it was predicted that they would die, but such was not the case.

In clipping the horse, I take off all the hair on the belly, trace high, up round the shoulders and in between all four legs. Think for a minute and it will be realised how much cooler and freer a horse must be to work with all that hair off. He sweats very little and dries very quickly at night, and is not the wet coated and miserable looking object that one sees in the mornings towards the end of sowing time.

Another point in favour of clipping is that there is not so much hair on the shoulders to become matted, hence there is less chance of sore shoulders.

Harnessing and Sore Shoulders.—The collars should be close-fitting, not too wide, nor too long. It is preferable to run the risk of choking a horse down now and again than have the collar too big. Big collars are the cause of many sore shoulders.

The hames should be fitted well up to the collar, with the draft hook fairly high up from the point of the shoulders, for it is on the points of the shoulder that most sores occur. It is a very common fault to see the points of hames hanging down; two, three and even four inches from the collar. That is another source of sore shoulders. The hames should fit snugly around the collar and should be strapped tight.

Sore shoulders are chiefly caused by carelessness, lack of humanity and bad management. If a horse has a little lump on the shoulder in the morning, examine the collar for the cause. If it is rough, use a hammer or bottle on it. If the cause cannot be traced, cut a hole in a sugar bag to fit over the tender spot, and it will probably not go any further. Do not leave it and think it will be all right in a couple of days. Instead, there will be a raw spot. Other methods are to change the collar or alter the position of the draft hook on the hames. A change of hames sometimes has the desired effect. Too many oats do not cause sore shoulders. More sores are caused from the lack of oats.

Working.—When starting a team after a week or two's spell, give the horses an hour or two's work each day for the first few days, so that their shoulders will not scald. If they are inclined to be free, endeavour to restrain them a little.

It is always advisable to load light on farm work. Put in an extra horse or two, so that they can walk along, instead of making heavy work of it. It will be found to be cheaper at the end of the year. I always work the team tandem, using pulley chains. This method keeps the horses straight ahead of the implement, which makes a marked difference with harvesting machinery.

If a team is fed and handled on the lines suggested, with a good man in charge, the owner will have something to be proud of, and what is more, will not be far behind the tractor man at the end of five years on a mallee farm.

THE FUTURE OF THE MURRAY MALLEE.

[R. Elliot, Kulkawirra.]

The subject of the paper is one which is exercising the minds of a large number of people at the present time, because there seems to be a danger of some of the partly cleared country reverting to scrub, to become a worse menace to the cleared country than if it had never been touched, because it will now grow enough feed to breed a supply of rabbits to overrun the surrounding country, and this county has been cleared at the expense of much hard work, with very little return, to the men who are losing it.

That the loss of this country is going to be a loss to the State goes without saying, for in its natural state it was practically valueless, but as soon as it was occupied and the occupier began to work it, it began to bring in revenue to the State. It is common knowledge that the mallee lines have been the best paying ones in the State, carrying as they have done large loads of heavy freight.

Wheatgrowing under present conditions is not a paying proposition, and the only hope for the future seems to be in providing feed and carrying larger numbers of sheep where sheep are already being carried, and in getting sheep on to all partially cleared land on which there are no sheep at present. A mallee farm without sheep can only be run at a loss. It will be necessary to fallow an area of land every year for the purpose of growing feed for sheep. Wimmera Rye grass seems to be the most suitable pasture plant, it is easily and cheaply established. In growing feed for sheep on fallow, include a small quantity of Wimmera Rye grass seed with whatever cereal is sown to provide the main feed crop, unless it is intended to fallow the area so used for a crop the year following the feed period. Lucerne does reasonably well, but it is fairly hard to establish, and rather expensive. One great need is for some suitable plant to grow on fallow to prevent drift, and to provide feed for sheep at the same time. Some hardy plant of the pea family, such as tares, could be tried for this purpose. The conservation of fodder as ensilage has been recommended, and may be of value, especially as feed for lambing ewes. The one obstacle appears to be labour, both in handling in the green stage, and later in feeding.

Each year foxes are responsible for the loss of many lambs. Foxes are very troublesome in large paddocks, particularly where there are bushes growing. They will kill big strong lambs several weeks old at times, but most damage is done while the lambs are very young. Some of these losses might be overcome by yarding the ewes in a small paddock and feeding with ensilage, so that the ewes will not run away through hunger and leave their lambs behind in the mornings, and will also come in towards camp in the evening.

PINNAROO LINE BRANCHES, LAMEROO, 8th AUGUST.

FAT LAMB BREEDING IN THE MALLEE.

[R. A. JENKINS, Lameroo.]

The majority of farmers in Mallee areas imagine that the greater the variety of lambs in their flock the greater the enchantment. It is not uncommon, on inspecting a farmer's rams, to see about half a dozen different colours, breeds, and shapes, and the ewes generally show just as wide a variation.

There are one or two salient features to be considered by those who contemplate lamb breeding. First, will the flock be managed primarily for the local or export market? and, of equal importance, what type of lamb is in demand in that market? Having decided these two points, the next decision is as to what type of parents should be used to produce those lambs, and at the same time adapt themselves to local conditions.

Unless the farmer is prepared to hand feed extensively, a very early lamb is not justified, because the average season does not open soon enough. If the lambs are of the Dorset or Suffolk type and they get a check, they take too long to recover, so that supplementary feeding must be added to the grazing to obtain the top prices of the early markets.

Catering for the export trade is where the average farmer goes astray. The export buyer does not want a long-legged, loose-loined carcass, nor does he want half a dozen different types. If farmers read reports on overseas shipments, they would be able to form some idea as to what is required by consumers.

The Southdown or Hampshire is the ideal type of sire for producing export lambs. Their progeny matures quickly, will recover from a lean time more quickly than any other breed, and the results of the lamb competitions during the last few years must surely have served the purpose for which the *Advertiser* proprietors in their wisdom inaugurated them.

For ewes, the big-framed crossbred is undoubtedly the best mother, but there are other factors to be considered by the farmer, such as tractability and the wool clip. Most farmers' fences are not of the best, and, as the crossbred is a notorious fencer, the big-framed Merino or the Corriedale is suggested.

In conclusion, use sufficient rams of one pure breed, study the consumers' requirements, feed the sheep well and handle them quietly, and do not market the lambs until they are ready.

HOW TO BREAK A COLT.

[C. H. B. Ross, Pinnaroo.]

To break an unbroken colt, have a good yard and a good strong rope about 40ft. long with a loop about 2ft. 8in. long. A long loop is advisable, for it gives a double rope around the horse's neck instead of a single rope where the short loop is used; it also prevents the horse from choking, because the end of the long loop will not pull over the knot tied in it. Have a stick about 10ft. or 12ft. long—a bamboo preferred for its lightness and less danger of injuring the horse. Drive the horse into a corner and pat him with the stick, all the time watching the horse's eye, patting all over his body and head. When the horse allows the stick to be put over his head without taking much notice, put the loop of rope over the end of the stick, allowing enough rope to make a large enough sling to slip easily over the horse's head. When the sling has been secured over the horse's head, see that it is well up on the head, with the knot of the loop well under his throat.

Have the assistant take the end of the rope around a strong post about 18in. above ground. This height will give less strain on the post and also help to prevent the rope from getting between the horse's ears, which is dangerous. Have the horse fairly close to the post, say, about 6ft. Have a man hold the other end of the rope by taking it around another post, making it easy for him to hold as the horse is pulling against him. By no means tie the rope until the horse has had a few good pulls. After the horse has stopped straining on the rope, approach him from the left, about level with his shoulder, with one hand extended, watching his eye all the time; pat him, talk to him coaxingly, and give him to understand that you are his friend. Obtain a leather headstall without a bit. Undo the noseband, unbuckle the headstrap. Approach the horse with the headstrap in the extended hand, and allow the horse to feel the headstall with his nose. Slip the headstrap over his head, rubbing him with one hand gently all the time. Buckle the headstrap. Do the same with the nosestrap. Hold the bit, slip a hand under his chin, buckle the bit on the off side first, hold the bitstrap on the near side, press the thumb against his gum, and slip the bit into his mouth, and then buckle. Get a light strap—the hames-strap of buggy harness will do. Slip the strap into the off side of the bit ring, pass it under the chin to the bit ring on the near side and buckle, to allow the bit to play freely in the horse's mouth. This is to prevent the horse pulling the bit ring into his mouth; also, it is easier for the man on the end of the reins when the horse is untied. The horse is now fully haltered.

Put a good rein on the near bit ring, slacken the tie rope, gently slacken the loop and take it off the horse's head. Now let the horse move around in the yard with the rein on the near side. Let him feel the rein gently at first, then make him move around in a circle to the left. Approach him and pat him, but be firm; also give him to understand that you are his master.

When the horse reins fairly well to the near side, put the rein on the off side bit ring and make him circle around to the off side for a while. Then put a rein on each side and make him stop and start at command. This should be enough for the colt's first lesson. Tie him up to a strong post at the manger with a bowline knot so that it may be untied without trouble.

When the horse is sufficiently trained to be put into the team, put him on the near side. Have a quiet horse next to him with a light rope doubly tied in a small loop just below the horse's hame hook. Put a rope halter over the colt's leather headstall and tie it into the loop of the hames of the horse next to him, just long enough to prevent the colt pulling on the rope halter when coupled up. When fully harnessed, keep a spare rein on him for the first round or two, but being tied to the other horses' hames the colt has very little chance of getting away. Put the colt on the near side of the team. All buckles are on the near side, and he has not the chance of loafing by letting his end of the swing rest against the double swing, which he has if put in the middle of the team.

To be a good horseman one must be fearless, be a lover of horses, and have unlimited patience. Use an open headstall for breaking young horses. Winkers should not be used altogether until the horse has worked for a time. If the colt does not take kindly to breaking in, or, if he is a kicker, tie up the near front leg by putting a loop around his fetlock. Pass the rope over his withers and pull it through under his girth. Lift his leg by pulling up, and let an assistant take up the slack of the rope. Pass it over the body again and under his girth, and the colt will be helpless. Let him caper around the yard on three legs. Keep pulling his head to the left, or else the rope over his withers will work over his body. Let him kneel and struggle until he is fully exhausted. Trim the tail and feet while the colt is tied up, and you will find that you have full control over him and he cannot do himself any harm.

CAN MORE USE BE MADE OF THE DEPARTMENT OF AGRICULTURE AND THE AGRICULTURAL BUREAU BY THE MAN ON THE LAND.

[L. Orwell, Lameroo.]

Primary producers in South Australia have in the Department of Agriculture a splendid organisation which is capable of doing a lot more to help improve the position of the people on the land and the State in general, provided sufficient funds are made available for the department to carry out the necessary work.

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During recent years, much has been said of the fall in quality of exportable primary products. If the quality and grading of products are not in keeping with what is demanded by the buyers, then it becomes the duty of the Department of Agriculture to investigate the reason why, with a view to putting the producers in the way of supplying products of the quality and grading demanded by the purchasers.

Probably the greatest problem facing the State is the absorption of the labour power of its people. Secondary industries cannot anticipate much further expansion owing to geographical position, therefore rural primary production will have to be resorted to as a means of absorbing labour power.

In the good rainfall districts, the South and South-East offer possibilities, but the area is limited, and, in the case of the South-East, heavy expenditure would be involved in reclaiming and draining. During the last 25 years, large areas of Mallee lands have been brought into occupation, much of the land being in the light rainfall area beyond Goyder's line, and consisting of medium to very light land. These areas offer opportunity for experimental work, for in the early stages of development, cereal growing on the light land is a losing proposition, and, as a result, many have had to leave their blocks. Land such as this provides scope for extensive experimental work, with a view to ascertaining whether the light sandy land can be successfully occupied. Public facilities, such as railways and schools, have in most cases been put in these districts; in many cases roads require improvement.

With the opening up of so much light country, another problem is beginning to assert itself, namely, sand drift. This is another field for experimental work, with a view to overcoming a problem that will really become serious when all the scrub roots and natural vegetation are worked out of the soil.

The economic position has altered very considerably during the last 20 years, and as a result those engaged in rural primary production have had to meet very high production costs.

These fall both directly and indirectly on primary production and cannot be passed on to someone else, as is done in the highly protected secondary industries, because the primary producer has, in most instances, to sell his produce at world parity. Can the Agricultural Bureau, representing all rural primary producing interests, help the man on the land to overcome the difficulties mentioned? There is a limitation on the Agricultural Bureau when a question becomes political; however, a few alterations in the constitution would smooth away the difficulty mentioned. What a great service the Agricultural Bureau could render the man on the land if a Chamber of Rural Primary Production was formed by the Agricultural Bureau to work co-operatively with it. The chamber would be competent to handle Customs duties, taxation questions, matters appertaining to Acts of Parliament, and the numerous questions arising from time to time affecting the man on the land.

Probably the hardest problem to solve is Customs duties, because it more often than not operates indirectly and tends to give traders advantages to the disadvantage of the primary producer.

It is time something definite was done with a view to approaching the machinery manufacturers concerning the standardisation of agricultural machinery and duplicate parts, with a view to reducing the cost of machinery and duplicate parts and cost of distribution of same.

A few matters that would come within the scope of work of a chamber of primary production have been mentioned; many others present themselves daily—matters which are of considerable importance to the man on the land.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, 28th August, 1935, there being present Messrs. J. W. Sandford (Vice-Chairman), who presided, R. H. Martin, S. Shepherd, Geo. Jeffrey, A. M. Dawkins, P. J. Baily, A. J. A. Koch, Dr. A. E. V. Richardson, Professor A. J. Perkins, and H. C. Pritchard (Secretary). Apologies were received from Messrs. H. N. Wicks and A. J. Cooke.

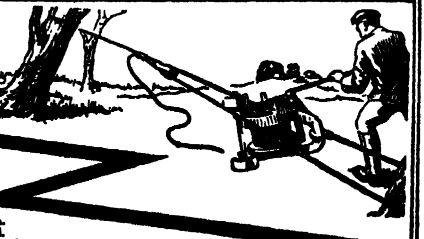
Congress.—The Secretary reported that His Excellency the Governor had intimated that he would be pleased to deliver the opening address at the 46th Annual Congress.

Branch to be Closed.—The Board decided to close the Overland Corner Branch.

New Branches.—Approval was given to the formation of a Branch at Brimpton Lake with the following as foundation members:—G. Dodd, V. Dodd, J. Dodd, A. Haines, A. Montgomerie, M. Aikenhead, M. Dunstan, E. S. Ashman, P. H. Wagner, H. Heard, J. Clothier, B. Rodgers. Conditional approval was also given to the formation of Branches at Devlin's Pound, Pinbong (Women's) and Georgetown (Women's).

Life Members.—Approval was given to the appointment of the following life members:—H. H. Howard, Petina; S. Shepherd, Kybybolite; B. Schenscher, Monarto South; L. N. Mills, Willowie; W. G. Crawford, Saddleworth; H. M. Parsons, F. C. Keen, J. W. Crompton, H. J. Jagger, Port Elliot. The congratulations of members of the Board were extended to Mr. Shepherd, who was present at the meeting.

New Members.—The following names were approved for addition to the rolls of existing Branches:—Alma—N. M. Freebairn, P. McD. Smyth, A. B. Smyth, H. L. Smyth, L. S. Smyth, R. M. McKenzie, M. McKenzie, J. L. C. Freebairn, C. Freebairn, H. B. Freebairn; Appila-Yarrowie—Arnold Wurst; Balumbah Women's—Mrs. W. Norris, Miss Alice Norris, Miss E. M. Swan, Miss L. M. Wohling; Baroota—V. D. Pillion, H. Dahlenburg, jun.; Belalie Women's—Mrs. A. H. Watkie, Mrs. Jas. Rundle, Mrs. Jas. Sparrow; Berri—P. C. Andrew, A. Campbell; Blackheath—E. T. Talbot; Black Springs—A. Heinrich, W. P. Heinrich, jun., O. Kermode, B. Heinrich, N. Heinrich, W. Heinrich, W. Hollis, S. Harding, G. Harding; Boors Plains—H. B. East; Brentwood—J. H. McKenzie, Mervyn McKenzie, R. J. W. Longbottom; Brownlow—Lawrence Ramm, Ivan Ramm, Rube. Smith, M. O. Steinborner, F. W. Roocke, G. H. Roocke; Butler—Melvin Coleman, K. Stewart, H. G. Turner, C. S. Coleman, W. B. Tilly; Carey's



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Conferences.—The Secretary reported that Conferences would be held at Alawoona, 1st October; Butler, 8th October; Yeelanna, 16th October; Wudinna, 18th October; and Lyndoch on 5th November.

Several items were taken in committee.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING MONTH OF JULY, 1935.

IMPORTS.

Interstate.

Apples (bushels)	280
Apples, Custard (bushels)	8½
Bananas (bushels)	16,284½
Citrus—	
Grape Fruit (bushels)	44
Oranges (bushels)	23
Passion Fruit (bushels)	331
Paw Paws (bushels)	11
Pineapples (bushels	1,123
Strawberries (bushel)	1
Nuts—	
Mixed (packages)	3
Peanuts (bags)	1,350
Peanuts, Kernels (bags)	90
Beans (bushels)	274
Cucumbers (bushels)	2
Lettuce (bushel)	1
Onions (bags)	1,078
Potatoes (bags)	9,740
Potatoes, Sweet (bushels)	44
Swedes (bags)	3
Bulbs (packages)	32

Plants, Ornamental (packages)	105
Roots, Grass (bag)	1
Seeds (packages)	48
Trees, Fruit (packages)	69
Trees, Ornamental (packages)	5
Wine Casks (No.)	3,504
Fumigated—	
Citrus—	
Grape Fruit (bushels)	24
Plants, Ornamental (packages)	6
Trees, Fruit (packages)	45
Trees, Ornamental (packages)	5
Wine Casks (No.)	113
Rejected—	
Bananas (bushels)	6
Paw Paws (bushel)	1
Lettuce (bushel)	1
Potatoes (bags)	17
Potatoes, Sweet (bushels)	5
Plants, Ornamental (packages)	4

Overseas.

(State Law.)

Wine Casks (No.)	1,953
Fumigated—Wine Casks (No.)	68

Federal Quarantine Act.

	Packages.	lbs.		Packages.	lbs.
Seeds, &c.	4,673	797,200	Tea chests	2,351	—
Canes	89	—	Fibre	1,518	512,585
Cocoanut Chests	625	—	Plants	2	110 (No.)
Corkwood	5	500	Timber	113,555	1,913,932 sup. ft.

EXPORTS.

Federal Commerce Act.

		Packages.
England	Apples	1
	Citrus—	
	Oranges	10,878
	Trees	1
India	Apples	684
	Vegetables*	31
Netherlands, East Indies	Apples	446
	Citrus—	
	Oranges	85
	Vegetables*	56

		Packages.
New Zealand	Citrus—	
	Oranges	22,080
	Plants	9
	Seeds	88
Singapore	Apples	50
	Citrus—	
	Oranges	22
	Pears	90
	Vegetables*	129
Straits Settlements	Vegetables*	15

* Potatoes excluded.

DAIRY AND FARM PRODUCE MARKETS.

A. W. SANDFORD & Co. LIMITED reported on 2/9/35:—

BUTTER.—Weather conditions being congenial throughout August, butter production satisfactorily advanced and it was estimated that supplies at the end of the month were 60 to 70 per cent. higher than for the corresponding period last year. This meant that heavy quantities were exported and, fortunately, the London butter market steadily improved and at date of report was ruling at 96s. to 97s. per cwt. for choicest Kangaroo. Local butter market under the equalisation plan has remained steady at the following rates:—Choicest creamery fresh butter in bulk, 1s. 2¾d. per lb.; prints and delivery extra. (This price is for local sale only and, under the quota system, the equalised price manufacturers will receive will be 11.4375d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines from 8d. to 11½d. per lb. for chiocest; stores, 6d. to 8d. per lb. (These prices are subject to equalisation levies.)

CHEESE.—Naturally the same conditions in conection with the season apply to cheese also, and it is anticipated that record quantities will be manufactured this season as the pastures are now sufficiently advanced to ensure good spring and early summer feed. Milk supplies are steadily increasing and should continue to do so until the end of the year. Exporting to Britain was maintained of all surplus cheese thus keeping the market cleared. London prices were cabled as being from 47s. to 48s. per cwt. and local rates are:—Large and medium from 9½d. per lb.; loaf from 10d. per lb. at store door, delivery extra.; semi-matured and matured, 11d. to 11½d. per lb.

EGGS.—There was a very big increase in supplies received on the packing floors recently, and a good deal of the shortage earlier in the year was made up. Packing for export to Britain is now in full swing and present local rates are:—Ordinary country eggs, fair average quality, 6½d. per doz. net; long distance rail or shipping eggs, lower; selected new laid clean eggs, full-sized, to 11½d. per doz. net.

BACON.—The mild to cold weather has resulted in the consumption of bacon being well maintained and factories kept the markets regularly supplied from day to day. The demand was for prime quality factory bacon, there being little interest shown in farm cured lots. Rates are:—Best quality sides, 9½d. to 9¾d. per lb.; middles, 10½d. to 11d.; heavy middles, 9d. to 9½d.; rolls, 8d. to 8½d.; hams, 1s. 1d. to 1s. 2d.; cooked, 1s. 2d. to 1s. 4d. per lb.

ALMONDS.—Only light supplies have reached the market during recent weeks and there was a steady demand which readily absorbed all offering. Rates are steady at:—Softshells and Brandis, 8½d. to 9½d. per lb.; hardshells, 5d. to 5¼d.; kernels 1s 9½d. to 1s. 10½d. per lb.

HONEY.—Little interest was shown in this commodity and, although odd parcels were sold Interstate, these were not sufficient to materially reduce the heavy stocks held and marketing conditions are still dull, rates being:—Prime quality clear extracted, 2¼d. to 2¾d. per lb.; lower grades, 1d. to 2d. per lb.

BEESWAX.—Was in fair supply and met with steady demand at:—1s. 4d. to 1s. 4½d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday and Friday at our salerooms, which are in every way the best equipped in the State. With the nearer approach of the Royal Agricultural Show and with the stocks of dressed poultry in cold stores having been reduced, buyers competed mone eagerly for all lots offering and rates for some grades were firmer, especially for prime quality heavyweight birds. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. 6d. to 4s. 9d.; nice conditioned cockerels, 2s. 10d. to 3s. 5d.; fair conditioned cockerels, 2s. 3d. to 2s. 9d.; chickens lower; heavyweight hens, 2s. 9d. to 3s. 3d.; medium hens, 2s 4d. to 2s. 8d.; light hens, 2s. to 2s. 3d.; couple of pens of weedy sorts lower; prime young Muscovy drakes, 3s. 6d. to 4s. 6d.; young Muscovy ducks, 2s. 3d. to 3s. 1d.; ordinary ducks, 1s. 3d. to 2s. 3d.; ducklings lower; geese 2s. 9d. to 4s ; goslings lower; turkeys, good to prime condition, 7½d. to 9d. per lb. live weight; turkeys, fair condition, 6d. to 7d. per lb. live weight; turkeys, poor and crooked breasted, lower; pigeons, 6½d. to 7½d. each.

POTATOES.—New season's, 13s. per cwt.

ONIONS.—Brown Spanish, 11s. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of August, 1935, also the average precipitation for August, and the average annual rainfall.

Station.	For Aug., 1935.	Av'ge. for Aug.	To end Aug., 1935.	Av'ge. Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·59	0 18	2·58	4·66
Marree	0·63	0 36	2·35	5·88
Farina	0·72	0·40	2·37	6·43
Copley	0·35	0·63	1·73	7·87
Beltana	0·40	0·65	1·83	8·48
Blinman	0·70	1·06	2·19	11·86
Hookina	0·45	1·15	2·43	11·25
Hawker	0·99	1·39	3·38	12·26
Wilson	0·94	1·21	3 49	11·79
Gordon	0·79	1·06	3·04	10·53
Quorn	1·39	1·70	4·22	13·22
Port Augusta	1·02	0·89	5·36	9·44
Bruce	0·93	1·08	3·49	9·87
Hammond	0·70	1·26	3·95	11·21
Wilmington	1·65	2·14	6·85	17·32
Willowie	0·95	1·40	5·01	12·25
Melrose	3·48	2·74	13·38	22·88
Booleroo Centre	2·01	1·83	7·57	15·21
Port Germein	0·86	1·38	6·63	12·53
Wirrabara	3·39	2 42	10·45	19·29
Appila	1·96	1·71	9·21	14·65
Cradock	0·72	1·12	2·89	10·82
Carrieton	1·32	1·46	4·88	12·23
Johnburg	1·08	1·21	3·61	10·58
Eurelia	1·01	1·59	3·72	12·79
Orroroo	1·43	1·56	5·48	13·20
Nackara	0·71	1·12	3·95	11 09
Black Rock	1·43	1·46	4·94	12·37
Oodlawirra	0·76	1·30	4 00	11·68
Peterborough	1·21	1 54	5·92	13·22
Yongala	1·77	1 82	7·65	14·44
NORTH-EAST.				
Yunta	0·22	0 72	2·93	8·55
Waukaringa	0·17	0·72	2·36	7·94
Mannahill	0·44	0·70	2·23	8·20
Cockburn	0·08	0·63	1·32	7·96
Broken Hill, N.S.W.	0·11	0·79	1·60	9·56
LOWER NORTH.				
Port Pirie	1·14	1·41	8·47	13·21
Port Broughton	1·43	1·67	10·06	13·88
Bute	2·24	1·95	9·83	15·44
Laura	2·11	2·20	10·88	17·95
Caltowie	1·41	2·11	8·36	16·74
Jamestown	2·42	2·25	10·22	17·69
Gladstone	1·94	2·02	10·08	16·29
Crystal Brook	1·40	1·96	11·14	15·78
Georgetown	1·77	2·26	10·37	18·37
Narridy	1·34	1·97	9·42	15·82
Redhill	2·05	2·19	12·28	16·59
Spalding	2·94	2·44	11·55	18·88
Gulnare	2·40	2·44	11·05	18·68
Yacka	2·00	2·02	10·63	15·39
Koolunga	1·63	2·00	9·61	15·38
Snowtown	2·87	2·10	11·00	15·74
LOWER NORTH—*continued.*				
Brinkworth	1·75	2·08	10·63	15·82
Blyth	2·26	2·03	12·79	16·78
Clare	2·97	3·07	15·91	24·51
Mintaro	3·44	3·32	16·02	23·42
Watervale	3·53	3·62	18·34	26·80
Auburn	3·17	3·04	16·49	23·98
Hoyleton	2·50	2·15	11·89	17·33
Balaklava	1·94	1·82	9·48	15·46
Port Wakefield	1·11	1·48	8·48	12·94
Terowie	1·73	1·63	6·16	13·35
Yarcowie	1 65	1·62	7·04	13·59
Hallett	2·57	2·15	10·74	16·46
Mount Bryan	2·78	2·27	11·91	16·83
Kooringa	2·31	2·20	10·51	17·85
Farrell's Flat	2·97	2·53	12·30	18·61
WEST OF MURRAY RANGE.				
Manoora	2·48	2·58	12·81	18·92
Saddleworth	2·50	2·49	13·22	19·60
Marrabel	2·81	2·75	13·45	19·96
Riverton	3·28	2·72	15·46	20·81
Tarlee	2·76	2·28	11·71	18·10
Stockport	3·63	2·08	13·63	16·93
Hamley Bridge	2·11	1·98	10·89	16·54
Kapunda	2·96	2·45	11·51	19·79
Freeling	2·34	2·27	12·42	17·83
Greenock	3·53	2·83	14·46	21·53
Truro	3·20	2·61	12·39	19·89
Stockwell	3·22	2·56	13·29	20·13
Nuriootpa	4·03	2·71	16·59	20·72
Angaston	4·20	2·93	14·58	22·42
Tanunda	3·44	2·82	16·39	22·02
Lyndoch	3·24	3·16	15·72	23·40
Williamstown	3·44	3·79	17·01	27·77
ADELAIDE PLAINS.				
Owen	1·51	1·89	10·33	14·66
Mallala	2·18	1·94	9·72	16·56
Roseworthy	2·45	2·17	12·19	17·40
Gawler	2·90	2·26	12·56	18·91
Two Wells	2·18	1·83	14·12	15·75
Virginia	2·83	2·11	12·92	17·18
Smithfield	2·92	2·23	13·08	17·64
Salisbury	2·49	2·30	13·17	18·56
Adelaide	3·22	2·54	15·98	21·15
Glen Osmond	3·75	3·24	18·28	26·05
Magill	3·73	3·14	17·77	25·53
MOUNT LOFTY RANGES.				
Teatree Gully	3·84	3·44	19·03	27·20
Stirling West	5·79	6·35	36·83	47·08
Uraidla	4·28	5·90	29·93	44·19
Clarendon	3·81	4·28	22·62	23·88
Happy Val'y Res.	2·56	—	17·70	—
Morphett Vale	2·46	2·75	15·67	22·66
Noarlunga	2·18	2·49	14·57	20·37
Willunga	2·42	3·22	17·50	26·02
Aldinga	2·14	2·49	13·57	20·27

RAINFALL—*continued.*

Station.	For Aug., 1935.	Av'ge. for Aug.	To end Aug., 1935.	Av'ge. Annual Rain-fall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	4·10	3·68	26·91	29·50
Inman Valley ...	4·86	—	24·53	—
Yankalilla	3·53	2·72	16·63	22·83
Mount Compass .	3·45	—	—	—
Mount Pleasant..	3·82	3·62	18·55	27·23
Birdwood	4·16	4·04	20·39	29·21
Gumeracha	4·92	4·59	23·67	33·41
Millbrook Res....	5·44	4·95	26·60	34·68
Tweedvale	5·89	5·04	28·32	35·99
Woodside	5·49	4·43	24·47	32·31
Ambleside	4·87	4·83	26·24	34·90
Nairne	4·34	3·59	20·59	28·22
Mount Barker ..	4·21	4·16	21·71	31·31
Echunga	4·82	4·28	24·77	33·30
Macclesfield	4·13	3·88	21·47	30·43
Meadows	4·43	4·58	24·88	36·16
Strathalbyn	3·22	2·34	14·50	19·31
MURRAY FLATS AND VALLEY				
Meningie........	1·52	2·19	11·29	18·37
Milang	1·81	1·68	8·86	14·91
Langhorne's Ck. .	1·98	1·73	10·04	14·87
Wellington	1·58	1·66	10·00	14·65
Tailem Bend	1·75	1·72	10·33	15·06
Murray Bridge ..	1·45	1·47	7·76	13·56
Callington	2·07	1·83	8·49	15·19
Mannum	2·29	1·24	8·20	11·49
Palmer	3·55	1·99	11·67	15·63
Sedan	1·24	1·50	6·06	12·11
Swan Reach.....	1·36	1·14	6·07	10·64
Blanchetown ...	0·99	1·11	4·89	11·01
Eudunda	2·26	2·24	12·05	17·17
Pt. Pass	2·46	2·56	11·92	—
Sutherlands	0·94	1·35	4·78	10·84
Morgan	0·60	0·95	3·99	9·17
Waikerie........	0·66	1·05	4·83	9·65
Overland Corner	0·40	0·99	3·48	10·32
Loxton	0·86	1·33	4·76	11·54
Berri	0·50	1·26	5·43	10·17
Renmark	0·59	1·08	5·76	10·41
WEST OF SPENCER'S GULF				
Eucla	0·61	0·95	9·46	9·96
Nullarbor	0·52	0·98	10·70	8·81
Fowler's Bay ...	1·22	1·48	9·04	11·94
Penong	1·75	1·65	8·22	12·27
Koonibba	2·18	1·71	8·92	12·13
Denial Bay	1·62	1·60	7·50	11·36
Ceduna	1·70	1·38	8·17	10·16
Smoky Bay	1·50	1·41	7·78	10·53
Wirrulla	2·18	1·63	10·29	10·54
Streaky Bay	1·75	2·02	12·99	14·88
Chandada	1·80	2·23	9·93	—
Minnipa	1·44	2·02	9·45	14·06
Kyancutta	1·30	2·08	10·29	—
Talia	1·23	2·25	10·92	14·76
Port Elliston ...	1·95	2·35	13·54	16·54
Lock	2·10	2·70	11·91	16·52
Mount Hope	2·44	—	16·11	—
Yeelanna	2·58	2·47	15·72	15·94
Cummins	2·56	2·79	15·40	17·60
Port Lincoln	2·83	2·67	12·67	19·42
Tumby	2 10	1 80	10·40	14·12
Ungarra	2·48	2·28	12·86	16·85
Port Neill	1·54	1·55	8·90	13·09

Station.	For Aug., 1935.	Av'ge. for Aug.	To end Aug., 1935.	Av'ge. Annual Rain-fall.
WEST OF SPENCER'S GULF—*continued.*				
Arno Bay	1·57	1·49	9·66	12·65
Rudall	1·64	1·78	10·60	12·64
Cleve	1·93	1·83	12·57	14·88
Cowell	1·62	1·12	6·45	11·07
Miltalie	1·97	1·53	11·08	13·67
Mangalo	1·28	1·81	9·18	13·91
Darke's Peak ...	2·04	2·29	12·50	15·18
Kimba	1·44	1·66	8·78	11·82
YORKE PENINSULA.				
Wallaroo	1·73	1·56	10·20	13·98
Kadina	1·98	1·89	11·75	15·64
Moonta	2·25	1·70	10·35	15·06
Paskeville.......	1·88	2·11	9·94	15·49
Maitland........	2·96	2·56	14·95	19·90
Ardrossan.......	2·57	1·78	10·57	13·97
Port Victoria ...	1·05	1·90	9·20	15·44
Curramulka	1·93	2·35	10·68	17·87
Minlaton........	1·45	2·41	10·45	17·79
Port Vincent ...	2·49	1·82	9·25	14·43
Brentwood	2·01	2·01	11·39	15·55
Stansbury	2·15	2·17	11·04	16·82
Warooka	2·10	2·39	11·69	17·49
Yorketown	2·57	2·23	14·50	16·88
Edithburgh	2·50	2·06	12·11	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	3·50	3·45	23·04	24·82
Kingscote	2·87	2·54	16·93	19·14
Penneshaw	3·17	2·59	15·06	18·92
Victor Harbour ..	3·67	2·54	15·98	21·37
Port Elliot	2·82	2·36	12·63	19·93
Goolwa	2·81	2·04	11·52	17·85
Maggea	0·81	1·34	5·45	10·04
Copeville	1·50	1·36	7·62	11·51
Claypans	1·86	1·41	7·01	10·38
Meribah	0·87	1·05	5·90	11·31
Alawoona	1·37	1·14	6·04	10·36
Caliph	0·98	1·72	5·35	—
Mindarie	1·42	1·56	6·60	12·21
Sandalwood	1·64	1·73	8·49	13·66
Karoonda	2·20	1·89	9·76	14·36
Pinnaroo	1·06	1·72	5·80	14·43
Parilla..........	1·39	1·72	7·83	13·82
Lameroo	1·78	1·88	8·55	15·97
Parrakie	2·59	1·94	11·48	14·62
Geranium	2·98	2·20	12·55	16·51
Peake	2·49	2·04	12·80	16·01
Cooke's Plains ..	2·43	1·85	11·05	15·30
Coomandook	2·37	2·14	11·79	17·09
Coonalpyn	2·62	2·14	13·46	17·61
Tintinara	2·33	2·23	13·78	18·71
Keith	2·76	2·16	13·66	17·92
Bordertown	2·46	2·22	13·96	19·21
Wolseley........	2·37	2·23	13·38	18·49
Frances.........	3·05	2·49	16·78	20·11
Naracoorte	3·44	2·77	19·03	22·66
Penola	4·06	3·31	19·30	26·01
Lucindale	4·15	3·02	22·76	23·34
Kingston	2·66	3·11	19·06	24·28
Robe	2·46	3·31	20·65	24·67
Beachport	2·89	3·55	23·06	27·09
Millicent	3·65	3·88	26·28	29·79
Kalangadoo	3·25	4·16	22·76	32·28
Mount Gambier..	3·19	3·89	19·93	30·45

AGRICULTURAL BUREAU REPORTS.

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Arthurton	*	—	—
Ashbourne	*	9	6
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Balhannah	*	—	—
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* No report received during the month of August R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

SUBJECTS DISCUSSED AT BUREAU MEETINGS.

If you have no other subject in mind, here is a list from which you might choose when asked to contribute to your branch programme. The list has been compiled from published branch reports.

Agriculture.

Barley Growing.
Harvest Reports.
Pasture Management.
Fallowing.
Care of Machinery.
Control of Drift.
Fodder Crops.
Haymaking.
Crop Rotation.
Seeding Operations.
Wheat Pickling.
Wheat Diseases.
Wheat Varieties for the District.
Seed Wheat.
Value of the Oat Crop.
Wheats for Milling.
Peas.
Wheat *v.* Sheep.
Wheat Varieties for Hay.
Crop Competitions.
Harvest Operations.
Value of Agricultural Experiments.
Cultivation.
Fertilisers and Manures.
Cultivator *v.* Plough for Fallowing.
Tobacco Culture
Meadow Hay.
Review of the Past Season.

Horticulture.

Cincturing.
Spraying.
Pruning.
Orchard and Garden Pests.
Fruit Drying
Drainage.
Potatoes.
Tomato Culture.
Vegetable Growing.
Citrus Culture.
Packing and Grading Fruit.
Budding and Grafting.
Orchard Cultivation.
Rack Building.
Fruit Preserving.
Irrigation.
Seepage.
Care of Orchard Equipment.
Farm Garden.
Diseases of the Vine.
Manures for the Orchard.
Fruit Tree Diseases.
Planting the Orchard.
Frost Prevention.
Fumigation for Scale Insects.

Livestock.

Calf Rearing.
Care of Farm Livestock.
Management of Horses.
The Brood Mare.
Colt Breaking.
Shoeing Horses.
Sore Shoulders.
Weaning Foals.
Lamb Marking.
Sheep Management.
Wool Classing.
Shearing.
Sheep Dipping.
Fat Lambs.
Handfeeding Sheep.
Poultry.
Shelter for Livestock.
Management of the Dairy Cow.
Care of the Breeding Ewe.
Pigbreeding and Management.
Ailments and Diseases of Farm Stock.
Sheep *v.* Wheat.
Rearing Turkeys.
Horse Breeding.
Herd Testing.
Rams for Farm Flocks.

General.

Afforestation.
Beekeeping.
Bird Pests.
Blacksmithing.
Book-keeping.
Preparations for Drought.
Ensilage.
Labor Saving Hints.
Fencing.
Fodder Conservation.
Vermin Destruction.
Care of Hides and Skins.
Farm Insurance.
Tank Building.
Shed Construction.
Farm Conveniences.
Concrete on the Farm.
Dam Sinking.
Scrub Farm Operations.
Farm Sidelines.
Bacon Curing.
Value of Native Birds.
Noxious Weeds.
The Agricultural Bureau.
Handling Dairy Produce.
Farm Buildings.
Layout of the Farm.
Firefighting.
Lowering Costs of Production.
Farm Records.
Subdivision of the Farm.

MOULDBOARD PLOUGHS V. DISC IMPLEMENTS.

The above was the subject of a debate held by the Coonalpyn Branch on 14th August. Messrs. C. T. George, E. Fox and H. Mincham spoke in favour of disc implements, and Messrs. C. Todd, sen., C. L. George, and R. V. Potter supported the mouldboard plough.

Chas. T. George stated that with the disc cultivator, one could go over the land in half the time taken with the plough and with equally good results, because it would not choke with rubbish, it would chop down the shoots, work the land to a finer tilth in the two operations, was lighter in draft and was altogether the better machine in scrub country.

C. Todd, sen., said that the stump jump mouldboard plough, when set so as to run true and worked under the conditions it was built for, gave excellent results. It was ideal for clearing out the bottom of the furows, leaving no ridges. All the ground was moved and well turned over, leaving a level bottom, which the disc implement would not do. The plough would pull more stumps than the disc and in ploughing grass and weedy land, the mouldboard turned the soil well over, covering both grass and weeds. Both types of plough were needed on a scrub farm, because until the land was well cleared there was work suited to each.

E. Fox, sen., stated that if it were not for the disc plough, hundreds of thousands of acres of mallee land would still be in a virgin state. In their district, if the mallee was rolled directly after seeding and burnt in March or April following, and then after seeding the land was worked three times with a light disc implement and sown early with Algerian oats, there would be very little trouble in getting a fire over the stubble. If one repeated the discing with a light disc plough during the following year and drilled oats again early, the land would be practically cleared, thanks to the light disc plough. In clearing heath land, one ploughing with a single jump disc plough, heavy type, would not clear the land, but would leave it in such a state that with ordinary care the yaccas were not hard to deal with. No other plough would do that. On old ground he had ploughed with a light twin disc, from 3ins. to 4ins. deep, and a heavy crop of dandelions and sheep weed resulted. That was turned under using the twin disc again, and a crop of pease was eventually sown on beautifully clean land. The light disc would leave a level bottom, when given the opportunity by working the land when in a suitable condition. The disc did turn the soil over as he frequently noticed on the surface a piece of clay which had certainly come from the bottom of the furrow. The disc would pull a large proportion of roots, and by running sheep over the ground for a year or two another ploughing would bring out the balance.

C. L. George stated that in new mallee country, the ground was a network of roots from 2ins. to 4ins. below the surface, and the share mouldboard plough got under the roots with the share and tore them up, thus giving the sown plant a better chance of moisture than among a network of roots. When a share plough had been used for breaking up the soil, the wheat or oat plant would grow right up to the root of the mallee, but when disced, nothing grew within a foot or two of the stump. The disc would not destroy the network of running roots, but merely jumped them if they were of any size. With the mouldboard better work was done in slicing the soil clean from the bottom of the plough and turning it right over, thus helping to kill most of the rubbish. In stony or rubble ground the disc would not penetrate the soil to any extent, the discs merely ran over any stones or obstructions, whereas the share plough dug underneath and pushed the obstruction to one side. For permanent clearing the share plough was unsurpassed, because it pulled more stumps per acre of ploughing than the disc. The disc certainly pulled out a few light or rotten roots, but should a stump resist, the disc would jump over it it, while as a rule the share plough dug in further and in most cases pulled out the root. It was better to pull out a root than to chop off the shoots as the disc did.

H. Minchan stated that he used a single jump disc plough as a means of pulverisation of the soil and it could not be excelled. He put it into the ground down to a foot deep, and by that method wrenched out practically all the yacca and small bushes which a share plough could not remove. A disc plough was able to work land that a mouldboard plough would not be able to deal with.

R. V. Potter stated that the mouldboard plough left a far more level seedbed. In the breaking up of ley land it left the furrows open to a certain extent, which allowed the air to percolate through the soil, whereas the disc threw down the furrows on top of each other in such a manner that the soil settled down and allowed no aeration.

Chas. T. George, in reply, said that the disc implement, being able to ride over obstructions, made for saving of time, and that the disc by passing the soil to one side did work that was equally as good as that of the mouldboard which turned the soil over. A disc machine would do all a mouldboard plough could do and more, as it worked land where a mouldboard would be useless.

Chas. C. George, in commenting on the foregoing debate, said that in shoot cutting and stirring up the soil in one operation the disc had the advantage, but the best results would be obtained by breaking up the land with the mouldboard plough, followed by judicious cultivation. J. Haydon had noticed that the ground was cleared much better and in less time by the use of the mouldboard plough, and the resulting returns were better than those received from the use of the disc.

C. G. L. Tiller said that after a few years when the land was cleared the disc was placed in the background and mouldboard ploughs and share cultivators were outstanding features in the preparation of the soil for cropping. A vote of members was taken and resulted as follows:—In favour of mouldboards, 19 votes; in favour of discs, 9 votes. (Chas. C. George, Secretary.)

THE APPLICATION OF NITROGENOUS FERTILISERS TO CEREAL CROPS.

At a meeting of the Whitwarta Branch held on 19th August, and attended by 18 members and 1 visitor, Mr. R. I. Herriot, B.Sc. Agric., read the following paper:—"At the opening of the Waite Agricultural Institute in 1925, amongst the first field experiments laid down was one to test several rotations, to determine the one most suitable to existing conditions in a less severe type of Mediterranean climate than we experience in this district and a rainfall of approximately 24 inches.

It soon became evident that under such conditions moisture was not the limiting factor in crop production, as is the general experience of the greater part of the wheat belt, and that almost as good wheat yields followed upon the pea crop as after a well-worked fallow. The explanation of this, of course, is that the pea crop builds up the nitrogen supply of the soil just as does a well-worked fallow. The possibility under such conditions of doing away with fallow and growing either a pea crop or supplying sulphate of ammonia to stubble lands was soon realised. The Waite Institute has now conducted a series of experiments upon the subject over a period of five years. Some very striking results have been obtained and these have directly responsible, during the last few years, for a drive by fertilizer companies to sell super-ammonia mixtures. An indication of the possibilities of super-ammonia mixtures under Waite Institute conditions will be given by a summary of their results over the period. The first point which shows up is that no appreciable increase in yield was obtained by applying sulphate of ammonia to crops sown on fallowed land. With stubble crops, however, very marked increases were obtained. The following is a list of average results over a period of three years, all plots receiving 2cwts. superphosphate and 1cwt. sulphate of ammonia per acre:—

Wheat after wheat; increase 7.7 bushels per acre due to nitrogen.
Wheat after barley; increase 7.1 bushels per acre due to nitrogen.
Wheat after oats; increase 6.5 bushels per acre due to nitrogen.
Wheat after peas; increase 6.1 bushels per acre due to nitrogen.
Wheat after fallow: increase .2 bushels per acre due to nitrogen.

Hence, under these conditions it can be seen that sulphate of ammonia has great possibilities in relation to stubble cropping. but it must be remembered that these results were only obtained after a primary dressing of 2 cwts. superphosphate per acre had been given. This necessity to first satisfy the plant's superphosphate requirement is most important, and any attempt to obtain results in any district with sulphate of ammonia at the expense of super. can only meet with disaster. These results obtained at the Waite Institute stimulated experiments throughout South Australia during last year. The results, although for only one season and therefore liable to considerable error, can however give some indication of what may be expected from super-ammonia mixtures. Of representative places throughout the State three only gave definitely profitable results, these being on Kangaroo Island and at Gawler River. The position throughout the remainder of the State is still fairly doubtful, but where certain special conditions exist it seems possible that mixtures may be profitably applied These factors seem to be linked up with the previous history of the field, nature of herbage plants and rainfall. Where the land normally produces strong growths of clover, or has recently carried a good growth of clover, the response of stubble-grown cereals to super-ammonia mixtures will certainly be disappointing Although there is no definite exeprimental data on the rainfall question, it is reasonably sure that profitable responses to nitrogenous fertilizers will not be generally obtained in areas receiving less than 17ins. annual rainfall, except perhaps on a few barren sands. The average rainfall for Balaklava is approximately 15½in. per annum, which figure has not been reached now for the past 7 years. Moisture deficiency on stubble lands would therefore become a limiting factor before anything more than very small amounts of sulphate of ammonia, if any, per acre. The district is also capable, when conditions are right, of producing quite good growths of burr clover. One of the main factors in developing this clover is superphosphate. As sulphate of ammonia is approximately three times as expensive as superphosphate, and as the average amount of superphosphate applied per acre is considerably below the optimum, it would be far more economical to overcome the nitrogen question by spending the extra money on superphosphate and growing clover. Many farmers have been sowing the same weight or even less of super-ammonia mixture per acre than they did previously with superphosphte. This is applying nitrogen at the expense of superphosphate, and may give a greener looking crop, but certainly not a better one economically.

After studying agricultural conditions in this district for almost four years, I feel sure that our major difficulties are not going to be overcome with super-ammonia mixtures. Our chief problem is overcropping, which has been responsible for a greatly decreased fertility level on many farms, and an increase in the incidence of Take-all disease. Take-all rarely occurs on fertile soils, because under these conditions soil bacteria are present in large enough number to exert a definitely antagonistic effect upon the Take-all fungus. Many farmers in the district are, however, definitely "wheatsick" and show considerable evidence of Take-all. The first and most important care for the district generally, is the widening of the rotation and the growing of more crops for "feeding off" rather than for grain crops.

The type of grain grown for feed is, comparatively, of little importance. Barley, on account of its quick growth in the early stages is a favourite, but as barley only tends to increase Take-all, oats should be substituted if possible. For the past three or four years I have been trying to encourage the adoption of W.A. white peas as late feed. These not only provide a good topping for lambs, but also considerably increase the soil nitrogen and organic matter level. They have definite possibilities in this district, and if generally grown they would certainly make super-ammonia mixtures a most unprofitable proposition. (Secretary, F. J. G. Collins.)

THE WORK OF FARRER.

In the course of a paper dealing with the above, read at a meeting of the Monarto South Branch on 17th August, Mr. L. W. Hein stated:—"In the eighties and nineties of last century, when the rust scourge was ruining wheat-grower's prospects in Australia and taking toll of crops to the tune of £2,000,000 per annum, conferences were held annually between 1890 and 1896 for the purpose of seeking methods for the control of the menace. Farrer was not invited to the first conference, but a paper specially prepared by him was read. He attended all the subsequent conferences, ultimately becoming the dominant personality, which no doubt lead to his appointment as Wheat Experimentalist to the New South Wales Department of Agriculture.

Soon after Farrer's appointment many new varieties of wheat appeared, among which were Bobs, Jonathan, Federation, Theo, and Comeback. All these soon found favour with wheatgrowers, each having been designed to suit certain climatic conditions and at the same time being more disease-resistant than the varieties previously grown.

It was Farrer's aim to extend the wheat areas further into the low rainfall lands of Australia, and Federation became famous between 1900 and 1908, because of its inherent properties of yielding satisfactorily under adverse weather conditions. Federation has been credited with adding increased wealth to Victoria to the extent of £250,000 in one season alone.

Prior to 1900 hard wheats and strong flours were regularly imported from Canada and U.S.A. to assist bakers in making satisfactory bread, but Farrer's strong-flour varieties rectified this. In connection with Comeback, Farrer was singularly fortunate in evolving early in his experiments a white wheat that was regarded by local and overseas authorities as the strongest white wheat known in any part of the world, and although it has been regarded by some as a shy yielder, it is still a favourite with many growers in all our wheat States, and in milling tests it is outstanding for its baking qualities.

Although Farrer died in April, 1906, it is interesting to recall that in 1933, when entries were invited for the World's Grain Exhibition at Regina (Canada), of the 56 entries of wheat collected from the wheatgrowers of the whole Commonwealth, all but one of the 29 prizes in the white wheat section, including the grand championship for white wheat—won by Mr. Jack Eade—went direct to "Farrer" wheats, or to crosses from his fixed strains. Farrer found our wheat industry more or less a sideline and in despair; he lifted it to be a thriving industry of great national value to the Commonwealth. Wheat breeders have not followed the example set them by Farrer. Their only objective has been to produce wheats of high yielding qualities, irrespective of their milling qualities. If our wheat does not come up to the required standard, our overseas markets will be lost, at a great cost to the producer. The most practical method appears to be the system of buying wheat according to grades. If that were done our wheats would be greatly improved, and a much more ready market would be found. It is better to grow a high milling wheat and be prepared to expect a lower return than to continue growing a high yielding wheat of a lower test and perhaps lose our overseas markets.'' (Secretary, C. F. Altmann.)

WHEAT VERSUS SHEEP.

In the course of a paper read at the Taragoro Branch meeting held on 8th August, Mr. J. Crooks took for example a cleared and fenced farm of about 1,200 acres, and dealt first with the returns from wheat growing. By sowing 300 acres to wheat and 300 to oats, with 300 to fallow and 300 left as grass land, it would be found that 10 horses would be sufficient to work the land. Good fallow should return 3 bags of wheat per acre, while oats sown to stubble land should return 3 bags per acre. 75 acres would give the required amount of hay, and would leave 225 acres of oats to reap as grain. The income (on last year's prices) should be as follows—

Revenue.

	£	*s.*	*d.*
300 acres of wheat, 3 bags per acre, at 2s. 4d. per bushel	315	0	0
225 acres of oats, 3 bags per acre, at 1s. 3d. per bushel	126	11	3
Total ..	£441	11	3

and 75 acres at 1 ton per acre would produce 75 tons of hay.

Expenditure.

	£	*s.*	*d.*
Superphosphate 19 tons at £4 14s. per ton (wheat 90lbs. and oats 45lbs. per acre)	89	6	0
Seed wheat at 1 bushel per acre at 2s. 4d. per bushel	35	0	0
Seed oats—1½ bushels per acre at 1s. 3d. per bushel	28	2	6
Cornsacks at 7s. 6d. per dozen	28	2	6
Second hand bags for oats at 4s. per dozen	11	5	0
Binder twine—2 bales	5	0	0
Sewing twine	0	12	0
Shares for plough and combine	2	5	0
Depreciation of plant valued at £530	53	0	0
Depreciation of farm team valued at £200	20	0	0
Wages for one man for harvest and seeding—14 weeks at 25s. ..	17	10	0
Total ..	£290	13	0

	£	*s.*	*d.*
Income	441	11	3
Expenditure	290	13	0
Difference	£150	18	3

Leaving £150 18s. 3d. at the disposal of the wheat farmer.

Sheep Farming.—To get the best results from sheep farming it was necessary to study the carrying capacity of the land and the methods to increase it. To increase the carrying capacity it was necessary to topdress the natural pasture and cultivate at intervals; also to sow a small area of cereals such as barley, rye, oats or wheat for ensilage or hay, so the ewes could be handfed during the summer, when feed became scarce. To increase the revenue, one could produce fat lambs for marketing. By topdressing in the winter and handfeeding in the summer with proper care and attention it would be reasonable to expect an 85 per cent. to 90 per cent. lambing. On a farm of about 1,200 acres under such a system it should be possible to carry 600 ewes, and during the winter, 510 lambs for about 6 months, when they should be ready for market. With wool at 9d. per lb., 600 4-tooth ewes should be worth 10s. per head, off shears. For that number 12 rams would be necessary—preferably of British or Corriedale breed at £3 3s. per ram. The returns should be as follows:—

Revenue.

	£	*s.*	*d.*
600 ewes cutting 10lbs. per sheep at 9d. per lb.	225	0	0
85 per cent. lambing—510 lambs at 11s. per head	228	10	0
Total ..	£453	10	0

EXPENDITURE.

	£	s.	d.
Interest on outlay for ewes and rams	16	18	0
Cost of super 45lbs. per acre	61	2	0
Seed oats, barley and rye	13	17	6
Binder twine	5	0	0
Woolpacks, 20 packs at 4s. each	4	0	0
Branding oils, dips, etc.	5	15	0
Cost of shearing	9	10	0
3 per cent. death to breeding	9	0	0
Depreciation to plant necessary for cultivation, etc.	44	5	0
Total	£169	7	6

	£	s.	d.
Income	453	10	0
Expenditure	169	7	6
Difference	£284	2	6

Leaving £284 2s. 6d. at the sheep farmer's disposal as against £151 4s. 3d. at the wheat farmer's. (Secretary—T. Winters.)

THE FARM TEAM.

At the annual meeting of the Brentwood Branch held on 12th July, Mr. C. H. Boundy read a paper "Breeding and Care of Horses," in which he stated that for a sire the new class of Clydesdale was to be preferred. He should be of quality to be registered in the stud book. In selecting a stallion the first points to look at were the feet and legs. A good clean leg was necessary, with not too much hair and with a fairly flat bone measuring about 11 inches, and standing in a little on the hocks, in order to give the horse a more even balance when pulling. The walk was important. A horse should have a good, clean, active walk.

By breeding always from such a sire the type of young horses would soon improve, even if the mares were not of the highest standard. It was a sound investment to buy a good mare of a similar type to the sire, but not quite so tall, and a little finer and more feminine. Farmers were often lax in caring for farm horses. Many farmers thought that only show horses should be groomed down every morning, but the horses that were working in the dust all day were the ones that required grooming. A horse that was well groomed would keep its condition far better than one that was not. Horses should be well stabled, and not kept in a draughty stable, because horses coming in hot from the paddock and standing in a draught were likely to contract pneumonia. They should be fed regularly and always be watered before feeding.

The brood mares should have a small paddock to themselves so that they could be watched. By so doing one could quite often save a foal from smothering, and could be of help to the mare in case of complications.

It was a sound idea to drench all horses, young and old, once a year with 1 bottle of Raw Linseed Oil and 2 tablespoons of Turpentine per horse. (Secretary, J. H. Boundy.)

At a meeting of the Yadnarie Branch held on 17th July, Mr. K. R. Kobelt read a paper entitled "Management of the Farm Team." He said that a tandem pull was the best, because it was easier to handle, a team of 10 horses abreast being too wide. It did not pay to overload the horses; an extra horse or two would enable them to walk without straining. A horse that was fast should have a long pair of chains, while the chains of a slow horse should be shortened by knotting, so that each horse would take his share of the draft. In working a freshly broken horse it was advisable to carry a whip on the implement, and if the horse was seen to be loafing the whip should be used. If that were not done such a horse would develop a habit of slow walking. In working horses that had been spelled for a long period, especially if they had been on greenfeed, an occasional spell was needed for the first few rounds; the team would settle down to its usual pace in a short time. A team should not be allowed to trot around corners, because of the danger of the horses treading on one another's feet. Care should be taken in handling the reins. A steady pull was all that was required. The reins should never be jerked, because such a practice caused the team to throw up their heads and made it difficult to guide them. Horses kept their condition better if they were worked early in the morning rather than late at night. Horses worked after sundown came in wet with sweat which would not be dry by morning. (Secretary, E. A. Spriggs.)

SORE SHOULDERS.

At the annual meeting of the Wolseley Branch, on 8th July, members discussed the fitting of collars to prevent sore shoulders. Mr. J. E. K. Ridgway advised using salt water to wash the shoulders of young horses. Mr. W. W. Merrett believed in bluestone water for hardening shoulders. Mr. Pilgrim used Neatsfoot oil on tender-skinned horses. Mr. V. M. Oborn advised taking the horses easy when commencing to work and feeding oaten chaff. Mr. E. R. Thiele washed his horses shoulders with warm water and soap, using alum for sores. Mr. E. W. Sharrad advised working horses quietly for say the first week; overworking was the cause of sores. The hand should be run down the shoulder before fitting the collar. Horses should not be worked with wet shoulders. Time should be given to accustom them to their food. Mr. G. D. Butler stated that hames were often the cause of sores on shoulders. He exhibited a pair of steel hames 6in. wide, which he said prevented sore shoulders. (Secretary, E. W. Sharrad.)

THE SHEEP DIP.

The above was the subject of the following paper by Mr. D. C. Harvey at the monthly meeting of the Hartley Branch on 14th August:—There are several types of dips used, and perhaps the walk-in dip is the quickest and easiest type to construct. The place selected to build a dip should be on the slope of a hill, though by no means too far up the slope. Dig a hole about 50ft. long, 3 ft. wide, and 5ft. to 6ft. deep, and gradually slope the last 10ft. for the exit for the sheep to walk out, thus making a total length of 60ft., and giving the sheep a swim of a little over 50ft. Build a good solid stone wall on both sides of the dip from bottom to top, leaving a width of about 16in. from wall to wall. Cement the wall 1in. thick. When cemented there will be a space 14in. wide between the walls for

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the sheep to swim through. A well about 18in. deep by 2ft. by 18in. should be made at the end where the sheep come out. This should contain a sieve into which the water from the draining pens will flow. The well can be covered with a wooden cover. A 3in. pipe should be laid from the bottom of the well to the bottom of the dip, passing under the slope where the sheep walk out. This pipe carries the water right into the bottom of the dip, thus avoiding damage being done to the exit by water rushing over the steps or grips for the sheep's hooves. A platform at the end where the sheep enter the dip made of suitable timber and running out above the water for 4ft. or 5ft. and 3in. above the water prevents any splash from the backwash made by the sheep going through the dip. It is the splash that stops the sheep from running. It is necessary to have a framework extending about 12ft. along the walls at the end where the sheep enter, in order to prevent the sheep jumping. *Yards.*—A large yard made of good timber should be erected. From this there should be a yard large enough to hold about 100 sheep. From this yard a small gate should open into a pen holding about 20 sheep. This pen should have a race to the mouth of the dip, about 8ft. long and just wide enough for a sheep to run through comfortably. *Draining Pens.*—These should have a fair slope and should be roomy and large enough to hold 200 to 250 sheep when full. Build the pen with a division in the centre. Erect a good, solid post at the edge of the well, which should be directly in front of the exit of the dip. A gate should be fitted to this post so that it can be swung to shut off either side of the division in the drainage pen. There should also be a gate at the upper end of the pen, so that half-drained sheep can be turned into the other side and left there to drain thoroughly before being turned out. The draining pen should have a good cement floor and a cement wall about 3in. high around the edge to prevent any water from escaping. The sides of the dip should be level with the ground. A lid of timber could be made, and when not in use the dip could be closed, thus avoiding sand and rubbish drifting in. It is possible to dip 250 to 300 sheep per hour in a dip of this type, providing the draining pens are sufficiently large. (Secretary, W. John Brook.)

PRACTICAL HINTS.

At a meeting of the Warramboo Branch held on 12th July, members supplied and discussed various hints, among which were the following:—Sew a piece of 4in. thin leather right around the drenching bottle, leaving about 1in. above the bottle. This minimises the danger of animals biting and swallowing pieces of bottle. *Mending small leaks in water pipe.*—Materials required: One small piece of rubber, slightly larger than the leak and one piece to just fit the pipe, a clamp 2 inches wide and U-shaped to fit the pipe, made out of a piece of petrol drum, and having holes to take ½in. or ⅜in. bolt. Place the small piece of rubber over the hole, then the other piece over it and around the pipe. Slide the clamp over the rubber and screw up tight, having the bolt opposite the hole in the pipe. *Leaking tank.*—When a tank shows signs of a leakage clean the part and brush over it with paint. Then stick on a new piece of calico, paint again and stick on another piece of calico. Finally brush again with paint. *An easy way to destroy rabbit burrows.*—Stand over the hole and drive a crowbar through the roof, then step back a few inches and drive in the bar again in another place. Continue until the hole is thoroughly broken in. (Secretary, H. F. Chilman.)

FARM ECONOMY.

The subject of the monthly meeting of the Marama Branch held on 16th August, was a paper entitled ''Farm Economy'' by Mr. W. S. Gray, who stated that present conditions made it necessary for farmers to economise. Economy did not mean sowing a smaller acreage or using less super per acre. Such action would be false economy. True economy lay in such matters as placing machinery under cover instead of leaving it exposed to the weather which soon did as much damage as the machine received while working. If no shed were available a covering of straw would be of value. Driving chains on machines soon became worn and caused much trouble by jumping off. The links could be bent by placing the chain on an anvil or flat piece of iron, with the surface of the chain which ran on the sprockets upwards, and placing a piece of ½ or ⅜in. round iron across the centre of the link and striking it with a hammer, thus causing it to bend and shorten. The writer preferred the above method to closing the hook. The life of harness would be prolonged if it were dressed regularly with neatsfoot oil. Oiling machinery was important; a few shillings spent on the purchase of a good oil feeder might save pounds in bearings and loss of time. It did not pay to use cheap oils. They had not the lubricating qualities of good oils and were usually thin, and thus ran out of the bearings very quickly. Keeping an assortment of bolts and nuts on the farm might save much travelling and loss of time in replacing a broken bolt. A supply of scrap iron would be useful when repairs were needed. Secretary, Thos. C. Kinkley.)

VERMIN DESTRUCTION.

At a meeting of the Brownlow Branch on 17th July, Mr. R. Smith, in the course of an address, stated that in the settled areas the most effective method of destroying rabbits was by digging them out wherever possible. Where digging was not possible, trapping and fumigating should be done. Digging out was preferred because the burrows were destroyed as well as the rabbits. The few rabbits (especially the does) that escaped had no burrows to hide in, and thus they were easily killed by dogs or guns. The above methods could not be used successfully in pastoral country, where poison carts were the only effective method of combating the pest. Foxes could be destroyed in a similar way to rabbits, by digging them out wherever possible. A fox would not take a bait as readily as would a rabbit. The best bait for strychnine poisoning was the head of either a rabbit or a fowl, or a piece of caul fat. Such baits buried on a trail made by dragging a heavy object along the ground at a place where foxes were known to prowl during the night *Blowfly*.—The use of fly-traps was recommended. There were two species of the bluetail fly, one known as the primary fly and the other as the secondary fly. The committee investigating the control of blowflies had concluded that the primary fly was responsible for the initial striking of sheep. The strike of the primary fly attracted the secondary fly, which caused the affected area to spread and become more serious than a bad primary strike. The primary fly was not caught in the traps in any great numbers, but even if only secondary flies were trapped an immense amount of good would be done, because the secondary fly caused the greatest damage. In order to be effective, fly-trapping had to be a united effort on the part of all concerned. Destruction of all carcasses should not be neglected, because they were the breeding ground of blowflies. (Secretary, A. R. Steinborner.)

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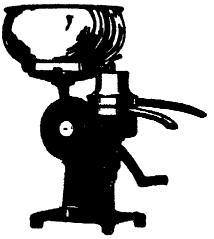

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FARM BUILDINGS.

The following paper was read by Mr. B. A. Koch before a meeting of the Kilkerran Branch on 12th August:—At the present low price of wheat and the high price of building material it is almost impossible to do any building on a farm, and where extensive buildings have been erected some years ago it is impossible to keep them in repair, as all iron roofs need renewing every 20 or 30 years in this district, close to the sea, and this is a very big item with iron about £25-£26 a ton. This is the reason why so many farmers are seen with only a hut for the farmer and his family to live in with no conveniences such as electric light, gas stoves, deep drainage, etc., which city people enjoy. The construction of a house should be the first consideration of the farmer. Here, he must go according to his pocket or bank book. If a modern dwelling is to be erected an architect should be consulted to draw a plan with detailed specifications. The plans must be all drawn to scale so that the builder can take all measurements from the plan. All pipe inlets and outlets should be planned beforehand, this being done the farmer should get an estimate of the cost to see that it will not cost more than he can afford, he will also have to decide whether to build with stone, mason work, reinforced concrete, or bricks. I would recommend stone walls for outside, if stone is available, and bricks for inside walls. Stone walls are cooler than concrete and also cheaper to erect where good stone can be got at a reasonable distance. On the other hand where the subsoil consists of clay, concrete would be the best, as stone walls usually crack very much in such places. A good solid concrete foundation should be put in. If there is any clay subsoil the foundation should be reinforced with steel rods; also a reinforced concrete course should be placed right around the building just above the windows. This will prevent cracked walls to a great extent. In all cases a good damp course should be placed on the foundation to prevent damp from rising up the walls. About 12 to 18in. of the outside wall should be plastered with cement at the bottom, this prevents magnesia creeping up the walls on the outside. Roofing iron should be painted between the joints with "Killrust" paint. This will prevent rusting at the joint to a great extent, this being a great problem in this district. Fibrous plaster is about the cheapest and best material to use for the ceilings, with wood cover-moulds. For inside plastering a good coarse sand should be used, with a good set coat for the finish, except for the kitchen, bath, and dining rooms. These should be plastered with cement, with a finishing coat of "Victor Hard." If done properly this makes a very hard and smooth surface. Water should be laid on to the kitchen, bathroom, and washhouse. The washhouse should be as close to the kitchen as possible and should be equipped with washtroughs, sink, and washing machine. The wash copper should not be inside the washhouse, as the steam makes it very unpleasant and unhealthy for working. It should be placed under a verandah just outside the washhouse. The motor garage should be built close to or joined to the house, so that it is unnecessary to go outside to get into or out of the car. This is very convenient in wet weather, and for transferring parcels to and from the car. Floors in the house should be of wood, except in the bathroom and washhouse, which should have concrete floors. Sheds and out-buildings should be constructed on similar lines with iron roofs. Shed doors should be wide enough to admit all big machines, and high enough to admit high loads. Implement shed and blacksmith's shop should be close together, so that repairs to machines can be done at any time without moving the machines, thus preventing waste of time in walking from one shed to the other. Where an extensive amount of blacksmithing is done the blacksmith's shop should be partitioned off from other machines as otherwise a lot of soot will collect on the machinery. The barn for storing seed and super should have a raised platform about 3 to 3½ft. high. This if large enough will save a lot of lifting, as loading and unloading can be done with sack trucks. A good stable should be provided for horses and built of stone with an iron roof. The chaff shed should be joined to the stable at about the middle to save carrying the chaff any great distance. The stables should be open to the north or north-east. Implement sheds should be of similar construction, and closed with sliding doors. The general practice of fitting sliding-door wheels to the bottom of the doors is wrong, because dirt and dust blow into the bearings and make the door hard to open and close and the wheels soon wear out. If they were fitted to the top not so much dust would collect and the doors would move much more easily. If cows are kept a shed should be provided for them to be fed in; this should also be near the chaff shed. The milking stalls should have a concrete floor and bails that can be worked from the back of the cow.

Points from Discussion.—Not advisable for motor garage to be under the same roof as the dwelling-house, on account of the risk of fire occurring in the motor garage. Expense did not warrant the engaging of an architect for an ordinary farm dwelling. Most timber mills provided plans and specifications. (Secretary, A. Sawade.)

PRUNING THE ORANGE TREE.

Mr. F. Lewis was responsible for the above subject at a meeting of the Ramco Branch held on 12th August. Mr. Lewis said there were hundreds of acres of citrus trees, very few of the owners of which had any idea of how to prune them. It was the usual practice to let them go for a few years, except to cut out any limb which grew straight up or was in the way. It was easy to grow oranges the first 10 years, but after that time the trouble commenced. By then they would be full of dead wood and it would be a very difficult job to remove a mass of dead wood and crossed limbs. However, an orange tree was one of the easiest trees to prune. It was first necessary to start from the butt and clean out all the dead wood, and then start pruning. It would be seen that the fruit was heavy but the limbs were pliable, so that all limbs grew outward and upward, but the heavy fruit dragged down the limb causing it to bend. A shoot grew out of the bend, and that went on year after year. It was obviously necessary to cut off the portion beneath the limb, *i.e.*, the spent wood. The limb brought down nearest to the butt had the most spent wood. Watershoots were wild growths that grew straight upwards, and if they bore fruit they were weighed down and produced cross limbs. The main trouble in pruning was to know how much spent wood to remove. Some growers took from the butt right to the end of the limb, while others removed only a percentage. Pruning should be done from the butt outwards. Where shoots were level it was possible to tell the old ones; they were dark and the new shoots were lighter in colour. (Secretary, J. J. Odgers.)

THE AGRICULTURAL BUREAU.

At the annual meeting of the Buchanan Branch held on 28th August, Mr. W. G. Hucks read a paper "Suggestions for Improving Future Meetings," in the course of which he referred to the information they had received from past meetings, from addresses by departmental officers and from the *Journal*. The Bureau had helped to bring about better farming practices by means of competitions, &c. The value of the social side of the Bureau should not be overlooked. An improvement in the meetings could be brought about by interchange of visits with other Branches. An occasional debate would also be of value. (Secretary, W. G. Hucks.)

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		South-Eastern District.		
Mundalla	31/7/35	16	Annual Meeting	A. Ross
Millicent	31/5/35	9	"Fat Lamb Raising"—K. K. Skeer	L. C. Hutchesson
Millicent	29/6/35	8	"Improvement of Second Grade Land"—H. J. Hutchesson	L. C. Hutchesson
Millicent	19/7/35	8	Annual Meeting	L. C. Hutchesson
Allandale East	8/8/35	10	Discussion	R. T. Laslett
Tantanoola	10/8/35	9	Discussion—Agricultural Bureau Constitution	L. J. C. Osborne
Mundalla	13/8/35	15	Address—S. Shepherd	A. Ross
Kybybolite	13/8/35	26	Veterinary Questions	A. S. Shepherd
Rendelsham	10/8/35	8	"Strawberry Culture"—F. R. White	F. Todd, jun.
Mount Gambier	14/7/35	16	Annual Meeting	J. E. Morphett
		Lower North District.		
Penwortham	24/7/35	14	Annual Meeting	A. R. Jenner
Alma	9/7/35	10	Address—W. C. Johnston	E. H. Drescher
Hanson	9/8/35	—	Woolclassing Demonstration—C. A. Goddard	M. de N. Lucas
Hanson	13/8/35	22	Discussion of Show Exhibit	M. de N. Lucas
Rosedale	12/8/35	15	"Fencing"—A. Muegge	W. E. George
Light's Pass	12/8/35	30	"Finance"—F. Bergstrom	C. A. Verrall
Koonunga	14/8/35	—	Annual Social	H. Mibus
Black Springs	12/8/35	18	Address—S. McNamara	K. H. Dunn

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
LOWER NORTH DISTRICT—*continued.*				
Truro	19/8/35	15	"Fat Lamb Raising"—W. E. Scott	L. S. Davis
Wasleys	15/8/35	23	"Requirements of the Soil"—Dr. A. R. Callahan	C. R. Currie
Stockport	16/8/35	14	Address—W. C. Johnston	Ralph V. Koch
Tarlee	26/8/35	25	Address—Prof. J. A. Prescott	N. L. Clarke
MID NORTH DISTRICT.				
Mount Bryan	27/7/35	6	Formal	A. A. Jefferies
Narridy	3/8/35	18	Address—E. L. Orchard	J. Klingner
Wandearah.	13/8/35	34	Wool Demonstration—C. A. Goddard	L. A. Jacobs
Redhill	13/8/35	6	Question Box	L. Harris
Beetaloo Valley	12/8/35	14	"Income Tax Returns"—Mr. Marchland	B. W. Giddings
Booborowie	26/8/35	5	"Income Tax Returns"—F. C. Catt	A. T. Fairchild, jun.
UPPER NORTH DISTRICT.				
Yandiah	25/7/35	—	Woolclassing Demonstration—C. Goddard	E. Keller
Yandiah	30/7/35	14	Annual Meeting and Social	E. Keller
Appila	8/8/35	19	Visit to Laura Mill—"Pelschenke" Test Demonstration	E. W. Wurst
Wilmington	13/8/35	23	Address—J. O. Hatter	Chas. Cole
Eurelia	14/8/35	—	Address—R. Lock	E. P. Wall
Morchard	9/8/35	10	"Back to the Land"—H. Tilbrook; "The Sheep Dog"—R. McCallum	E. Tilbrook
Baroota	12/8/35	15	Address and Wool Demonstration—C. A. Goddard	E. W. Hulster
Booleroo Centre.	26/8/35	8	Addresses—F. C. Richards and J. O. Hatter	J. J. McCarthy
Murraytown	17/8/35	16	Annual Meeting	E. B. Pitman
YORKE PENINSULA DISTRICT.				
Boor's Plains	1/8/35	20	Annual Meeting	S. G. Chynoweth
South Kilkerran	5/8/35	23	"Crop Competitions"—E. H. Dutschke	R. E. Hasting
Paskeville	13/8/35	12	"Correct Seeding and Seeding Implements"—Mr. East	J. Prouse
Weavers	5/8/35	11	Homestead Meeting and Discussion	H. W. Cornish
Bute	15/8/35	9	Discussion	H. G. Perry
WESTERN DISTRICT.				
Goode	17/7/35	8	Annual Meeting	Ben. A. Linke
Miltalie	27/7/35	10	Annual Meeting	S. D. Ramsey
Koppio	31/7/35	14	Thirtieth Annual Meeting	M. T. Gardner
Kelly	3/8/35	17	Discussion—"Sand Drift"	F. R. Illman
Petina	16/7/35	12	Annual Meeting. "Treatment of Wounds"—H. H. Howard and W. Brownrigg	W. E. Stone

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		WESTERN DISTRICT—*continued.*		
Butler	23/7/35	9	Question Box	C. F. Jericho
Laura Bay	9/7/35	18	Annual Meeting	P. S. Morrison
Kyancutta	6/8/35	13	Annual Meeting	E. A. Kelly
Palabie	7/8/35	9	"Pig Raising"—S. North	E. H. Rashleigh
Green Patch	8/8/35	10	Appointment of New Members	C. J. Whillas
Balumbah	13/8/35	9	"Outstanding Dis-advantages"—T. V. Wright	J. E. Swann
Mount Hope	13/8/35	13	"Tree Culture"—J. H. Vigar	J. L. Vigar
Wallala	7/8/35	11	Formal Report	C. F. Zippel
Chandada	13/8/35	10	Discussion	H. J. Chewings
Pinkawillinie	15/8/35	7	"Sheep and Wool"—F. T. Freeth	L. F. Freeth
Pygery	13/8/35	9	"Agriculture on E.P."—E. Edmonds	A. Day
Laura Bay	13/8/35	12	Discussion—"Goyder's Rainfall Line"	P. S. Morrison
Ungarra	12/8/35	15	"The Horse"—J. Duffield	W. G. Gordon
Chilpuddie Rock	14/8/35	10	Discussion	H. Brown
Cungena	1/8/35	10	Discussion—"Wheat Commission Report"	A. A. Voumard
Butler	20/8/35	11	Annual Meeting	C. F. Jericho
Maltee	8/8/35	15	First Aid Demonstration and Paper—H. Box	E. Schwarz
		EASTERN DISTRICT.		
Berri	24/7/35	—	Annual Meeting	E. J. R. Johnson
Coonalpyn	14/8/35	30	Debate—"Disc *v.* Mouldboard Plough"	Chas. C. George
Berri	27/8/35	—	Citrus Pruning Demonstration	E. J. R. Johnson H. L. Badman
Pinnaroo	12/7/35	20	Discussion	H. L. Badman
Pinnaroo	7/8/35	160	Social Evening	H. L. Badman
Pinnaroo	22/8/35	21	Annual Meeting	
		SOUTH AND HILLS DISTRICT.		
Longwood	13/7/35	9	Discussion—"Grasses Suitable for the District"	H. G. Haines
Monarto South	20/7/35	18	Formal Report	C. F. Altmann
Lenswood and Forest Range	29/7/35	10	Question Box	B. F. Lawrance
Hope Forest	1/7/35	8	Social Evening	H. J. Hunter
Hope Forest	5/8/35	12	Formal Report	H. J. Hunter
Springton	7/8/35	6	Discussion	E. Brokate
Yundi	31/7/35	13	Addresses—V. F. Gameau, C. F. Anderson	T. R. Smart
Cherry Gardens	15/6/35	13	"Some Changes in this District"—Hy. Jacobs	A. R. Stone
Cherry Gardens	9/8/35	39	Address—Adelaide Chemical Co.	A. R. Stone
Hartley	14/8/35	8	"The Sheep Dip"—D. C. Harvey	W. John Brook
Frayville	15/8/35	14	"Milling Wheats"—K. McLean	H. H. Ramm
Blackheath	15/8/35	10	Questions	E. H. Paech
Currency Creek	5/8/35	12	Annual Meeting	D. Jeff. Gordon
Currency Creek	19/8/35	13	"Home Tanning"—L. Collett	D. Jeff. Gordon

WOMEN'S BRANCHES.

SUBJECTS FOR BUREAU MEETINGS.

If you have no other subject in mind, here is a list from which you might choose when asked to contribute to your branch programme.

The Farm.

- Dairying—
  - Care of Milk and Cream
  - Buttermaking
  - Cheesemaking
- Pigs—
  - Bacon Curing
- Beekeeping—
  - Honey
- Horticulture—
  - Vegetable Growing
  - Flower Growing
- Poultry—
  - Dressing
  - Incubation
  - Rearing Chicks
  - Turkeys
  - Ducks

The Home.

- Home Management—
  - Furniture—
    - Choice
    - Repairing
  - Needlework
  - Knitting
  - Rugmaking
- Clothing—
  - Choice
  - Repairing
- Dressmaking
- Pattern Afternoon
- Children—
  - Care and Management
- Cooking—
  - Recipes
  - Recipes for Christmas
- Lunches
- Jam Making
- Fruit Preserving
- Fruit Drying
- Fruit, Value of
- Pickles and Sauces
- Sweet Making
- Exhibition of Home Crafts
- Christmas Gifts
- Home Nursing

General.

- Inter-Branch Visits
- Competitive Exhibition
- Flower Show
- Practical Demonstrations
- Social
- Music in the Home
- Good Reading
- Hobbies
- Physical Culture
- Labor Saving Hints
- Spring Cleaning
- Entertainment in the Home.

PINNAROO LINE BRANCHES, LAMEROO, 8th AUGUST.

This year's Conference of Pinnaroo Line Branches was held at Lameroo on 8th August, under the auspices of the Wilkawatt Branch. Mrs. H. L. Billing (Wilkawatt) presided and about 90 delegates were present from the Parrakie, Parilla, Wilkawatt, Parilla Well, and Pinnaroo Branches.

Mr. A. J. A. Koch (Member of the Advisory Board of Agriculture) addressed the gathering, and congratulated the Women's Branches on the progress they were making.

Miss E. Campbell gave a very interesting address on "Suggestions for Home-Made Inexpensive Christmas Gifts," and displayed a number of dainty and simply-made gifts from such every-day materials as old straw and felt hats, old millinery flowers, kid gloves, odds and ends of cretonne, silk, linen, and voiles, old discarded crockery decorated with fancy paper and made attractive. Even the old binder twine from the chaff shed had its use among the gifts.

Mrs. H. L. Billing gave an address entitled, "Suppose We Laugh," and quoted extracts from "The Optimist."

Sister Ashton, of the Lameroo Hospital, read a paper, "Infectious Diseases," and gave some helpful advice to the home nurse in taking precautions to check the spread of infectious diseases.

Papers, "Gelatine and Its Uses" and "Dried Fruit Recipes," were read by Miss J. Mattiske (Pinnaroo) and Mrs. A. Sumsion (Wilkawatt).

The Parilla Branch displayed several very handsome hook rugs, the work of Mrs. Seidel.

Mrs. J. Steer and Mrs. E. Altus (Wilkawatt) gave a demonstration of boning a fowl before cooking and exhibited a gelatine of fowl prepared in a similar manner. The following papers were read and discussed.

RECIPES FOR THE USE OF DRIED FRUIT.

[Supplied by Mrs. A. YOUNG, Pinnaroo.]

Apricot and Lemon Marmalade.—Ingredients: 1lb. dried apricots, 1lb. lemons, 5 pints boiled water, 5lbs. sugar. Method: Wash apricots, put into a bowl and pour on boiled water and leave to soak for 24 hours. Cut lemons and soak in some of hot water. Let stand to soak for 24 hours. Boil lemons a little before adding apricots, boil until tender, add sugar, and boil about ¾ hour.

Apricot and Pineapple.—Wash and soak 1lb. of apricots for 48 hours in 6 breakfast-cupfuls of water. Procure a small tin of pineapple, and after cutting it into small pieces, put it and the juice of the pineapple with the apricots. After steeping the apricots, cut them up. Put all into a preserving pan, not forgetting the water in which the fruit has soaked. Allow to boil for half an hour, then add 3½lbs. of sugar and boil for 25 minutes longer.

You can use apricots, nectarines, pears, apple rings, or peaches for the following recipe:—To every pound of dried fruit allow 3 pints of water, 3lbs. of sugar, 1oz. of sweet almonds (blanched and chopped in half). Wash the fruit well and put it to soak in the water for 2 days. Simmer gently until tender, then add the sugar (warmed) and the almonds. Boil for half an hour. Pot while hot and cover next day.

Apricot Sponge.—Cook ½lb. dried apricots (washed and soaked) with 1 pint water. Add sugar to taste. Drain juice from fruit. Dissolve 2 dessertspoonfuls gelatine in ½ cup hot water and add to juice. When the mixture is thickening, add beaten whites of 2 eggs and whisk all well together until it is very thick. Set in a dish with a little dried fruit decorating it. Serve with cream and custard.

(Samples of each of these recipes were shown when paper was read.)

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SEVEN INVALID RECIPES MADE FROM ONE CHICKEN.

[Mrs. E. A. ALTUS, Wilkawatt.]

(Grilled chicken, 1 fillet of breast; roast chicken, 1 fillet of breast; steamed chicken, 1 thigh; fricasse chicken, 1 thigh; chicken romakins, drumsticks of chicken; chicken cream, scraps off breastbone; chicken broth, carcass and giblets.)

Chicken Broth.—Carcass and giblets, small piece of onion, 1 sprig parsley, 1oz. barley, 1½ pints water. Wash barley, put all ingredients into saucepan with a little salt, simmer for 3 hours, then strain.

Chicken Romakins.—Boil drumstricks; when cooked cut meat off and mix with 1 tablespoon cream, melt ½oz. butter and stir in ½oz. flour; mix with stock drumsticks were boiled in. Stir till thick, add chicken and little parsley. Grease some romakin cases, sprinkle with bread crumbs; put mixture in, sprinkle with breadcrumbs, put piece of butter on each and bake till golden brown.

Steamed Chicken.—Trim thigh, rub over with lemon, wrap in buttered paper; allow to steam for ½ hour or till tender, serve with parsley sauce.

Roast Chicken.—Fillet off breast, 2ozs. butter, chopped parsley, salt, lemon juice, wrap breast in buttered paper, and stand in fireproof dish, with half the butter, and cook for ½ hour; baste well. Mix remainder of butter with parsley, salt, and lemon juice, lift chicken out on to hot dish, spread the mixture over it, and serve.

Grilled Chicken.—Breast of chicken, 1 tablespoon butter. Have grill-iron hot, spread a little butter on breast, grill for 8 minutes, turn over every two minutes, and spread with butter. Put on hot plate and spread with butter, sprinkle with chopped parsley, pepper, salt, and lemon to taste, then serve.

Fricasse of Chicken.—Simmer other thigh of chicken in ½ pint water until tender. Melt ½oz. butter, stir in ½oz. flour until smooth. Add to stock and stir till boiling, cool a little, then stir in 1 egg well beaten and salt. Reheat and it is heady to serve.

Cream Chicken.—Scraps of meat off breast and body bones. Simmer in 1 cup of milk until tender, then add 1 dessertspoon cream, chopped parsley, pepper, and salt; thicken with cornflour and sprinkle with nutmeg. It is best to use broth first, as giblets will not keep as well as other parts.

FLOWER GROWING.

[MRS. IRELAND, Parilla Well.]

Make the garden at the north side of the house in order to receive as much sun as possible. It is best to have it a little on the slope so that water will not lie on it too freely in the winter months, and to form long narrow beds to facilitate picking the flowers.

There are many plants that can be planted in January, February, and March, to provide early winter and spring flowers. There are no blossoms more beautiful in a garden than Delphiniums with their rich shades of blue. Mignonette, Stocks, Gaillardias, Petunias, Sweet Sultan, Sweet Peas, Antirrhinums, Indian Pinks, Larkspur, Carnations, Scabious, Linaria, Verbena, and Marigolds are plants which will bloom almost all the year with plenty of water and a little attention.

Pansies and Violas are very attractive and are easily grown. Antirrhinums are very showy, and are always in bloom, but they do not last long. Perennial Aster is a very nice flowering plant for autumn; it is ideal for decorating and needs little attention. It should be cut down as soon as it has finished flowering. There are several spring flowering plants that can be grown with very little trouble; Poppies, Lupins, Cornflower, Godetia, Dianthus, Candytuft and Calliopsis.

The Carnation is a flower that almost stands alone for scent and beauty and is also a plant that will last for years.

The greatest enemies of the plants are rust and spot. This will be recognised by brownish-gray spots on the leaves. Pull off and destroy by fire any spotted leaves.

During rainy weather dust them once a fortnight with lime. These plants should be planted 18ins. apart and in rows about 2ft. apart. Afer flowering, pick off dead pods and any dead wood, but do not cut the bush back; this will spoil the bush for winter flowers.

Scabious need not be destroyed every year. It will keep crowing and produce nice blooms if manured. They can be planted in the same way as carnations and top-dressed with stable manure. Put a heap of horse or cow manure on the bed where the water can run all over the bed, and put the hose in the middle of the manure and turn the tap on. The garden soil should be kept dug, soft and free from weeds. It is a good plan to have more space than is wanted to plant in the garden, so that some of the soil will lie idle for a while. All bulbs should be dug up and stored in a dry place until it is time to plant them again.

A sprinkler is best for watering small plants, and this should be done in the morning before the heat of the day. If the ground is too hard, coat it with manure and drift sand; that will soften the soil and hold the moisture.

PICKLES, SAUCES, AND CHUTNEY.

The above was the subject of the paper read by Mrs. R. Lines at the meeting of the Gladstone Branch held on 16th July:—"Every housewife likes a stock of pickles and sauces on her cupboard shelf. Most of them are easily made and cheap compared with the bought article. Pickles and sauces are not regarded very favourably by dieticians, but are liked by practically everybody, and one can economise considerably by making a year's supply at home with fruit and vegetables grown in the farm garden.

Pickles have very little food value and eaten in large quantities can be harmful to digestion, but they serve a purpose in adding zest to all manner of foods, especially in summer time when appetites are jaded, besides providing frills to every-day fare.

Good sauces can be made from plums or apples, while the marrow or pie melon will form the basis of a number of delicious pickles and chutneys when cucumbers or cauliflowers are lacking. Firm, fresh vegetables and just ripe fruit that is picked on a dry day gives best results.

A home made vinegar is ideal for all kinds of pickles, but if using the purchased article, always use a good quality malt vinegar to avoid harshness. White vinegar gives a better appearance to clear pickles such as onions or cucumbers and it should always be used for preserves that are to be exhibited. Acetic acid sometimes recommended, is merely a substitute. All vinegars are diluted solutions of acetic acid. A copper pan can be used for jam making, but never on any account use copper for vinegar preserves. Fears concerning aluminium have been proved groundless and it is quite as good as an enamel-lined pan. Use a wooden spoon to stir for preference. Clear pickles are made by pouring spiced vinegar over salted vegetables, and mustard pickles by adding a mixture of flour, mustard, sugar, cayenne, and tumeric for colouring purposes, to the boiling vinegar and vegetables after they have been boiled 10 to 20 minutes.

The methods for making tomato sauce is to boil tomatoes, onions, and spices for perhaps an hour, strain, add other ingredients, and boil perhaps another 2 hours. Most tomato sauce recipes contain apples, and by mincing the apples it cooks to a mash quicker. A colander makes a good strainer, but if the seeds are not desired, strain again through net. Here is a good strainer:—Have a piece of wire gauze, nail it firmly to a box that has no top or bottom, or failing a box, 4 good pieces of board with the gauze tacked on would be the same. Have it high and large enough to stand over your basin, and then it is quite easy to do the straining.

Paper is an inadequate seal, but if it must be used, stick 3 thicknesses together with egg white or hot water starch. When dry, paste it securely over the jar. Then brush all over with melted paraffin wax for greater safety. If corks are used, dip first into wax or good clarified mutton fat, and push into bottles firmly. Or lay a piece of string across the mouth of the jar and then push in the cork. When the bottle is to be opened pull one end of the string and the cork will come out easily. Metal screw tops are liable to rust with pickles. To help prevent the rust, pour a little melted wax into lid and turn the lid until all crevices are coated. When set, screw down tightly, and the hot jar will melt the wax into all crevices and make the jar airtight. If the jars have become cold, screw on the waxed lids and dip into hot water which will melt the wax again. Then give an outside coating if necessary. If a recipe is altered always make a note of it for future reference, otherwise good fruit and vegetables may be spoiled.

Chutneys are easily made. They will cook while the dinner bakes and be ready to eat next day. A few pounds of fruit makes quite a lot of chutney. Yellow peaches, figs, apricots, sour cooking apples, ripe or green tomatoes, varied in different ways, makes a number of different chutneys. Any fruit or vegetable can be made into chutney. When a different flavour is wanted for a curry, try adding some chutney. Delicious sandwiches can also be made with chutney. Chutneys are meant to be sweet, but if a sour preserve is preferred, alter the quantity of sugar to suit the taste. Always taste the chutney about ½ hour before bottling so that if desired, any extra flavouring or spice will have time to blend with the other ingredients. After chutney has been kept for some time it is inclined to become solid. To remedy this, empty into a saucepan and add a little water until soft. Heat it slowly, continually stirring to melt the sugar.

Pickled Grapes.—Select dark, late grapes, pack into jars in small bunches. To each quart of vinegar add ½lb. sugar, ¼ stick cinnamon, 1oz. whole spice. Boil and cool. When cold, pour on to the grapes, and put a plate on top to keep the grapes under the vinegar. Ready for use in 3 weeks.

Several other receipts were given by Mrs. Lines. (Secretary, Mrs. L. Sargent.)

INVALID RECIPES.

The following recipes were supplied by Mrs. E. Altus, of the Wilkawatt Branch, at the meeting held on 21st May, all of which can be made from the chicken:—

1. *Grilled Chicken.*—Breast of chicken, 1 tablespoon of butter. Have grill iron hot, spread a little butter on breast. Grill for 8 minutes. Turn over every 2 minutes, and spread with butter. Put on hot plate and spread with butter. Sprinkle with chopped parsley, pepper, salt, and a squeeze of lemon if liked.

2. *Roast Chicken.*—Fillet off breast, 2ozs. butter, chopped parsley, salt, lemon juice. Wrap breast in buttered paper and stand in fire-proof dish with half the butter and cook for ½ hour, baste well, mix remainder of butter with parsley, salt, and lemon juice. Lift chicken out on to a hot dish, spread the mixture over it and serve.

3. *Steamed Chicken.*—Trim thigh, rub over with lemon juice, wrap in buttered paper, steam for ½ hour or until tender, and serve with parsley sauce.

4. *Chicken Cream.*—Scraps of meat off breast and body bones—simmer in 1 cup of milk until tender, then add 1 dessertspoon of cream, chopped parsley, pepper, and salt. Thicken with cornflour and sprinkle with grated nutmeg.

5. *Fricasse of Chicken.*—Simmer other thigh of chicken in ½ pint of water until tender. Melt ½oz. butter, then stir in ½oz. flour, add this to stock and stir until boiling. Cool a little, then stir in 1 well beaten egg, salt to taste. Re-heat, and it is ready to serve.

6. *Chicken Ramakins.*—Boil drumsticks. When cooked, cut meat off and mix with 1 tablespoon cream, melt ½oz. butter, and stir in ½oz. flour. Mix with stock drumsticks were boiled in, stir until thick, add chicken and a little parsley. Grease some ramakin cases, sprinkle with breadcrumbs, put mixture in cases, sprinkle with more bread crumbs, put a piece of butter on each and bake until golden brown.

7. *Chicken Broth.*—Carcass and giblets of chicken, small piece of onion, 1 sprig parsley, 1oz. pearl barley, 1½ pints of water. Wash barley, put all ingredients into saucepan with a little salt. Simmer for 3 hours, then strain. (Secretary, Mrs. W. Pritchard.)

DO NOT NEGLECT THAT COLD.

Paper contributed by Mrs. Hampel at the May meeting of the Wilmington Branch:—

An ordinary cold may not be a very serious matter, but it inflames the tender lining membranes of the nose, and once this condition has set in, other colds are likely to follow. When once a child starts to have a series of colds, his appetite suffers, as well as his general virility and well-being; and often, after a time, enlarged tonsils and adenoids follow. These stand in the way of the child's general development until they have been removed. Ear troubles often follow as a consequence of bad colds, and even the teeth are affected in time, because constant mouth breathing prevents the proper formation of the jaw. Every mother should really look upon the common cold as an enemy to health and one that may bring many others along with it.

If a baby has a cold, one cannot do a great deal for him beyond keeping him quite warm and out of draughts; keeping his bowels well open, and giving a lighter diet than usual with frequent sips of water. His nose can be cleaned with a camel hair brush dipped in warm olive oil, and a little white vaseline should be rubbed into the root of the nose to prevent soreness. A healthy baby should throw off a cold quickly, and if he does not, he needs medical attention. Older children should be given light nourishing food and plenty of fluids—water, barley water, and fruit drinks. A child whose head is stuffed up with catarrh will not need heavy meals, and is better without them. If the cold is very heavy, the weather severe, or if there is any temperature, the child is best in bed and out of draught in an airy room; and if he is kept warm, should throw the cold off quickly. The nose must be kept as clear as possible, and it is best to use paper hankies or scraps of soft, old sheeting which can afterwards be burnt.

It is important to teach children to blow their noses thoroughly, one nostril at a time, but a child with a cold should not be encouraged to blow too hard, for this sometimes has the effect of forcing the discharge into the cavities on each side of the bridge of the nose. If there is a tendency to a tickling cough, it will be found that glycerine, honey and lemon, or black-currant tea (made with jam or jelly and boiling water—all cheap, homely remedies) have a most soothing effect. Syrup of squills and tolu is also a good cough mixture that can be given throughout childhood. Sometimes, however, a cough is so persistent that nothing appears to check it, and often a child will cough through the whole night. In such cases, the best remedy is to paint the throat with a clean brush dipped in glycerine and tannin. It is not very pleasant, but it gets to the root of the trouble, and most children will submit to it if they are rewarded with a black currant lozenge or piece of barley sugar.

A chest cold needs a doctor's supervision, for with children there is always a risk of bronchitis. For a chest cough, glycerine, honey, and lemon is a good cough mixture; it is soothing, and seems to "cut" the phlegm. Rubbing the chest with camphorated oil will sometimes give relief, and is an old and helpful remedy.

A child with a healthy throat should not get a severe sore throat; when this occurs frequently, it is usually a sign that the tonsils need attention. But, sometimes a child will suffer from a red, inflamed throat after going out in a cold wind. It is always best to isolate a child with a sore throat, for it may be an early sign of one of the infectious ailments, and if a child has a throat with whitish patches on it, the doctor should be sent for. It may be a mild attack of tonsilitis, or septic throat, but it may be something more serious. However, a mild sore throat should clear up quickly if the child is kept warm and in bed if there is any temperature. Gargling is soothing and effective, and a mild carbolic gargle is usually given to any child who is old enough to be taught not to swallow. Glycerine lozenges can be given freely, and the diet should be very light and easily eaten—broth, beef-tea, a poached egg, or steamed fish, jelly, custard, grapes, and the rest. *Prevention.*—Feed the children well, keep them warm, provide good strong shoes, keep them away from crowded places and they should not catch cold. Teach them to breathe through their noses, how to blow the nose properly,

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provide clean hankies regularly, and impress upon each child that a hankie is a personal possession, and on no account to be borrowed. It is a good plan to teach every child to gargle from an early age. Gargling keeps the throat healthy, and greatly aids resistance to germ infection. Above all, it is best to have advice about a child who has a constant run of colds in spite of every care. The probability is that the nose and throat are not quite healthy, and often the simple operation for the removal of adenoids and tonsils will do a lot for a child, curing constant colds and improving his general health and development. If these precautions are taken, the little ones should go through the winter splendidly, and then if they do catch a cold it will not be nearly as severe, and one which they can quickly throw off.

A paper, "Lemons and Their Uses," was read by Mrs. Genders. (Secretary, Mrs. Cole.)

WARCOWIE.

Mrs. W. J. Sanders read a paper, "Jam Making," at the July meeting, which was attended by 9 members and 2 visitors. (Secretary, Miss L. Martin.)

HOUSEHOLD HINTS.

A Useful Fire Box.

Included amongst a number of "Useful Household Hints" which were given at the May meeting of the Balhannah Branch was the following:—

This labour saving hint is for a room which has a plain open fireplace. Such fireplaces are difficult to keep clean and spick and span, especially at this time of the year when one has a fire every day or evening. Take a petrol or kerosine tin, turn it on its side and cut it, full height at the back, and low in the front. Turn the front edge neatly (over a wire is a good plan, but not necessary). The hole through which the contents are emptied makes sufficient draught to ensure a good blaze. In the morning, nearly all the ashes will be safely in the tin, which is easily carried out and the ash dust on the hobs and mantel shelf is thereby almost avoided. If a basket grate is used a tray made from an old tin is useful for the purpose of collecting the ashes easily. After emptying the ashes the next fire may be set ready in the tin and carried in to the fireplace or left outside until it is required. When using the tin, the fire will burn sooner after lighting, than in an ordinary open fireplace. If something better is preferred and one of the men-folk is a handy man, he may have a spare length of sheet steel which can be made quickly into a fire box with a few rivets. There is no need to perforate the tin for more draught, and further by doing so one would not be able to save the ash dust. The tin will last a whole winter. This idea also has the advantage of saving the bricks from burning out so quickly, and is therefore an excellent labour saving hint. (Secretary, Miss D. Spoehr.)

"Household Hints" were also discussed by the O'Loughlin members at their meeting held on 16th April. Mrs. Mueller, who judged the hints, awarded Mrs. A. Kloeden first prize and Miss M. Kloeden second prize. The following are some of the hints submitted:—A lump of sugar added to the water used for washing oilcloth or linoleum gives it a brilliant and lasting polish. Heat the dry coffee before pouring on the boiling water. This brings out the flavour and a smaller amount of coffee is needed. To clean a burnt enamel dish, stand it out in the sun for a week or more, and it is surprising how easily it is cleaned. The sun bleaches the enamel and makes it quite white. To have a cool drink out in the paddock, fill the lid of the billy-can with water and rest it on top of the billy, which must also have water in it. The water in the lid will be quite cool in a very short time on the hottest of days, even if stood in the sun, though the shade is better. A good remedy for cuts is to smear castor oil on the wound, and it will heal quickly. Put a little piece of soap in the blacklead when adding water to it to make a lather. This gives a good shine and makes the polish adhere to the stove. Wool that is to be kept for any length of time should be wound round a moth ball, and moths will not touch it. An onion poultice will soon relieve the worst earache. The onion must be partly baked. Moths can be kept away from furs and woollen materials by putting a piece of linen damped in turpentine in drawers and wardrobes. For colds take Elder flour 4 or 5 times a day, with or without sugar, according to taste. It will speedily give relief. When washing the separator add 1 teaspoon of borax to the water. It removes all bad smells caused by milk in hot weather. When boiling cabbage, place a colander to top of the saucepan; this allows the steam to escape, but prevents the cabbage from boiling over. The potatoes can be steamed at the same time by putting them in the colander. To get rid of "rope" in bread, burn a piece of old leather either in the stove or in the vessel where the bread is kept. This is a certain remedy. (Secretary, Mrs. J. Foggo.)

Still another Branch—Pinnaroo—devoted a meeting on 7th June, at Mrs. E. Staker's homestead, to the subject of "Household Hints." The use of brown paper when pressing ties, trousers, pleats, &c., is more effective than a damp cloth. A quick and simple way of separating the yolk of an egg from the white is to crack the egg into an ordinary pie funnel. The white will flow through without breaking the yolk. A penny placed in a vase of flowers will make them last twice as long. To stop oilcloth from cracking, rub it with a mixture of oil and vinegar in equal quantities. This is specially useful in a room where the heat of the fire dries the oilcloth.

Woodworms.—A new way of destroying woodworms in furniture is to mix paraffin and castor oil and apply generously, dropping it into the hole with the quill end of a feather. A piece of butter added to the milk when making a blancmange will make it turn out from the mould far more easily.

Kitchen Hints.—Labels on kitchen tins will not be affected by the steam and peel off if the gum on the back is moistened with glycerine instead of water. To clean aluminium, wash each article with soap and water then rub it over with a piece of flannel dipped in pure olive oil. Fabric gloves should be washed on the hand in good warm soapsuds. Rinse them in clear water, and finally in slightly soapy water, and dry them on a turkish towel. Tomatoes which have become soft and over-ripe can be made quite firm again if they are placed for a short time in a bowl of cold water, to which a little salt has been added. Damp salt is very useful for cleaning tall glass vases, decanters, and enamelware. To remove paint stains, first soak the stain with turpentine to soften the paint, then add ammonia. Brush this now and again and wait for half an hour. After this wash in very cool soapy water containing ammonia, and the stain will gradually disappear. A piece of silver paper from a chocolate put on one side of a new piece of soap will stop all wastage of soap while it is lying on the soap dish. It is also very pleasant to hold and nearly doubles the life of the tablet.

Removing Stains.—Table stains, such as tea, coffee, wine, and fruit should, after washing, be well rubbed with household ammonia and then treated with hydrogen peroxide in the proportion of 1 part to 100 parts of water. Rust, ironmould, and ink yield to salts of lemon rubbed lightly in with a smooth stick of wood. The stain should rest over a vessel containing boiling water. It may be necessary to repeat the process, but a final thorough soaping and rinsing in ammonia water should be given. Oil, tar, and grease yield most easily to benzol after steeping in boiling water. Apply around centre of stain. *Benzol is highly inflammable, and the work should be carried on in open air.* Blood stains should be washed in tepid soda water. If that fails, repeated applications of ammonia should be tried. Paint stains should be dealt with immediately by applying benzol, and, after it has been well rubbed in, the linen should be washed in hot soapy water. When boiling split pea soup, always add a slice of bread; this prevents the peas from sinking to the bottom of the saucepan. Four cups of water and 2 tablespoons methylated spirits is a good solution for washing mirrors. If soot should fall on the carpet, cover it thickly with salt. The salt and soot can then be swept up without damaging the carpet. (Secretary, Miss Mattiske.)

CAKE MAKING HINTS.

"Cake" was the subject of a meeting of the Sheoak Log Branch on 1st August. Members supplied various recipes. The following paper was read by Mrs. Bowden:—

"Cake-making is an art in itself, and there are indeed many recipes, some appearing just duplicates of others, but on examination it will be found that slight differences do exist either in quantities or methods, and every cook knows that a slight variation may make all the difference.

The baking of a cake might well be said to be the most important part of the entire process, since so much of the success depends upon it. Therefore, be sure the oven is at the right temperature for the type you intend to bake. In the country, where we are compelled to use wood stoves, it is wise to light the fire about an hour before one intends to bake, and in this way the oven is evenly heated.

Never attempt to cook different kinds of cakes in an oven at the same time, as different types require different treatment. Small or layer cakes require a hotter oven than a loaf cake, because they must bake quickly before drying out; a large cake must bake more slowly, so that the heat may penetrate to the centre before too hard a crust is formed on the outside. The heat required for a sponge should be higher than that used for fruit cakes, and, on the other hand, slightly cooler than is required for scones, pastry, little or rock cakes. An oven in which scones or little cakes have just been successfully and quickly baked is ideal for a sponge, after the fierce heat has burnt down. In the case of sponges, too hot an oven browns the top at once, and interferes with the normal rising, while too cool an oven delays the rising, and the result is disappointing. Do not open the oven door for at least five minutes; then only for a glance. It is a mistake to put on wood whilst cooking a sponge—and, indeed, most other cakes—as it generally spoils the cooking. It is always wise to place the cake as near the centre of the oven as possible, as this gives a more even temperature, and thus ensures more even rising.

The baking of large cakes may be divided into four quarters. During the first quarter the cake begins to rise; during the second it begins to rise and to brown; during the third it finishes rising and continues to brown; the fourth it finishes browning and shrinks from the sides of the tin. It is usually a mistake to move a cake whilst cooking, as it is apt to cause the fragile cell walls to break, and then the cake will fall. If baking unevenly, it is better to move it before the crust is formed.

Open and close the oven door very carefully. Before starting to mix, prepare the tins, paper, &c., and then have all the ingredients ready at hand, because once the mixing is started it is a mistake to run here for something and there for something else. Preferably grease the tins with butter, or with some types they are better lined with greased paper. Medium high tins for sponges are preferable to shallow ones, as they allow the cake to rise to its full height without spilling; on the other hand, it is a mistake to have too high a tin, as this prevents the free circulation of the air. It is always wise to weigh ingredients in preference to measuring. There are two classes of cakes, butter or sponge, and all recipes are on one of these foundations. A shortened cake may be stirred or beaten, or mixed in any other way, providing all the ingredients are thoroughly blended. The usual practice is to cream butter and sugar, add beaten eggs and beat, then flour, milk, &c., and beat again. Careless mixing results in a coarse cake, long beating gives a fine, but heavy grain, while a small amount of beating gives a light and delicate texture. The whole aim in beating a sponge is to introduce as much air as possible in each separate process. Some use S.R. flour in place of plain flour and raising powders. Its use however, is not recommended, as it contains too high a proportion of raising for a cake that should be well beaten. The cake will rise well but it will be coarse in texture, and not the soft fluffy specimen you desire. Quite a number of cooks use no raising at all, when making sponges. They depend on extra air incorporated by long beating. Most people add melted butter, which is recognised as optional, but generally hot water and milk are added. This also assists in the rising and keeps the cake moist and fresh.

When eggs and sugar are beaten sufficiently, fold in sifted flour and raising powders. On no account must the flour be beaten in, and do not give a single stir more than necessary. Lastly with a light touch add melted butter, water or milk, or any desired flavouring. Testing with a skewer is not necessary. Just press top lightly and if no impression is left, the cake is cooked. Sponge rolls are preferably cooked on greased paper in bottom of oven with the heat slightly higher than when cooked in sandwich tins. To be able to recognise the cause of success or failure is beneficial in cake making. Success depends upon a well proportioned recipe, careful weighing of ingredients, and right temperature of the oven. A poor specimen is often due to too slow an oven, too much sugar or fat causing heaviness with too little flour, thus a badly proportioned recipe, and careless mixing all tend to give poor results. Recipes for cocoanut puffs, German nut cake, nut cake, Berlin tart, walnut cream cake, ginger sponge, and Henley cake were supplied by the writer. (Secretary, Miss K. M. Koch.)

''Suet Pastry for Winter Dishes'' was the subject of the following paper by Mrs. B. Schenscher at a meeting of the Monarto South Branch on 17th August. While the cold winter days are with us dishes made with suet pastry are very appetising and nourishing. In the popular form of boiled or steamed pastry it is one of the best means of spreading a too-small quantity of meat. What is more appetising on a cold wet day than a meat pudding rich with gravy and vegetables or a homely ''roly-poly'' oozing with hot jam or apples? Here is a reliable recipe for the pastry:—½lb. S.R. flour, pinch of salt, 3ozs. suet (or lard may be used), and enough cold water to make a nice firm dough. Put the flour in a basin, add the finely shredded suet and mix with a knife, gradually adding the water. Roll out to any required shape. When making the pastry for a fruit pudding or ''roly-poly'', milk may be used for the mixing instead of water. A very nice pudding is as follows. Line a pudding basin with pastry, half fill with rhubarb, add just a little water and plenty of sugar, then cover with pastry. Now put a plate on the basin, tie down with a cloth, and boil for 2½ hours. This is delicious served with cream, either hot or cold. The pastry can also be used for dumplings. For plain ones to serve with treacle or jam, roll the pastry into small balls, roll them in flour, and drop into fast boiling water. Boil 15-20 minutes according to size. These dumplings make a good substitute for potatoes by adding extra salt, pepper, chopped onion, and parsley and roasting them together with meat. When there is some cold meat left over from the previous day, a stew may be made with vegetables and onion. Half an hour before it is to be served cover with pastry and either steam or bake it. A tasty rabbit pie may be made by first boiling your rabbit in salt and water till tender, then taking the meat from the bones and putting in a pie dish layers of the meat, carrots, turnip, potatoes, and onions, with salt and pepper to taste, and steaming on top of the stove until the vegetables are tender. Next put on your pastry crust and bake until done. Meat that would only serve one person may be made to serve the whole family by making it into a pie or "roly-poly". The very newest cook need have no hesitation in attempting to make this form of pastry, and it is also economical. (Secretary, Mrs. F. W. Liebelt.)

THE HOME LIBRARY.

The above was the subject of the following paper by Mrs. L. Pascoe at a meeting of the Wepowie Branch on 7th August:—The home library is mostly limited to a few books, and these are not always well chosen or selected for their literary value or educational help. The home library too often consists of fiction of a nondescript character, and our children are not brought into touch and given a taste for literature. Some parents even forbid their children to read books with the idea that it teaches them to be indolent and neglectful of their work; thus their minds are starved, and they are robbed of a rich inheritance. We are surprised at this, because the schoolmaster has been abroad for so many years teaching the value of education. Education consists in training the hand, eye, and heart, as well as the brain. The training of girls and boys to read good literature rests very largely with parents in selecting and supervising their reading. If the home library contains only a few books they should be well chosen and selected from our best authors, with the view of furnishing the mind with food for building up the character of men and women. In reading good books we not only get a pleasant pastime, but the mind is enriched and our hearts made bigger so that sympathy, kindness, toleration, and love will reign supreme in the human breast. In the home library there should be books for girls and boys; books of adventure are always interesting to young people, but do not encourage the penny dreadful or the fourpenny detective type. Books by Henty and Conan Doyle are instructive and thrilling for boys. The home library should contain books of the tact, push, and principle type, such as *Samuel Budget, the Successful Merchant*, and biographical works, Shakespeare, Tennyson, Longfellow, and a good dictionary; also a home doctor's book should be found in every home library.

1935 CALENDAR 1935

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1936 CALENDAR 1936

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● FULL MOON

No home library should be considered complete without a Bible, apart from our belief that it is the inspired Word of God, its moral and spiritual teaching is of untold value. The literary merit of the Bible surpasses that of any other book. All great literary writers seem to be well acquainted with this Book. Before I conclude I will mention a few of the authors and books suitable for all ages:—*Fairy Tales for Tiny Tots;* for the older girls and boys, school annuals and adventure stories of all descriptions; for girls just in their teens, the Anne Books, the Pollyanna Books, Louisa M. Alcott, and Ethel Turner. The following are suitable for young ladies:—Florence Barclay, Temple Bailey, Gene Stratton Porter. For boys, Mary Grant Bruce, Edward Elliss and some of Zane Grey's. For older people, E. P. Roe, Harold Bell Wright, and Augusta J. Evans Wilson. (Secretary, Miss E. Roche.)

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		WOMEN'S BRANCHES		
Eurelia	17/7/35	16	Annual Meeting	Mrs. E. P. Wall
Mangalo	10/7/35	15	Recipes	Mrs. F. Coles
Mundalla	1/8/35	9	Annual Meeting	Miss M. Fisher
Balumbah	31/7/35	10	Annual Meeting	Miss H. D. Jericho
Narridy	3/8/35	23	Rug Making Demonstration—Misses V. and L. Roberts	Miss B. J. Reynolds
Coonawarra	17/7/35	25	Annual Meeting. Exhibition of Women's Work	Mrs. O. M. Skinner
McLaren Flat	1/8/35	12	Problem Afternoon	Mrs. B. Powell
Taplan	24/7/35	13	Address—Poultry Expert	Mrs. W. Flynn
Saddleworth	6/8/35	8	Annual Meeting	Miss G. E. Frost
Pinnaroo	2/8/35	21	Annual Meeting	Miss N. A. Mattiske
Snowtown	2/8/35	50	Rug Making Demonstration—Mrs. E. L. Orchard	Mrs. A. Hocking
Penola	7/8/35	23	Annual Meeting	Mrs. F. J. Kidman
Wilmington	8/8/35	9	Papers by Mrs. Davison and Secretary	Mrs. P. Cole
Wasleys	1/8/35	40	Cooking Competition	Miss J. Braun
Morchard	14/8/35	10	Special Meeting—Congress	Miss F. A. Brown
Coonalpyn	14/8/35	19	Butter Sponge Cake Competition	Miss E. E. George
Williamstown	7/8/35	7	Annual Meeting	Mrs. G. E. Cundy
Mudamuckla	9/8/35	16	"Care and Feeding of Children"—Mrs. Noske	Mrs. C. H. Kuhlmann
O'Loughlin	13/8/35	10	Question Box	Mrs. E. E. E. Lutz
Eurelia	14/8/35	9	Question Box	Mrs. E. P. Wall
Balumbah	11/8/35	15	Special Meeting (Third Anniversary Dinner)	Miss H. D. Jericho
Tantanoola	7/8/35	12	"Biscuits"—Mrs. Pycroft	Mrs. Gus. Altschwager
Wilmington	16/8/35	25	Address—Miss E. Campbell	Mrs. P. Cole
Clare	3/8/35	16	Exchange of Plants, and Question Box	Mrs. A. Pollock
Kangarilla	15/8/35	37	"American Afternoon".	Mrs. C. Steer
Sheoak Log	21/8/35	250	Annual Social	Miss K. M. Koch
Wirrabara	15/8/35	7	Annual Meeting	Mrs. A. Curtis
Balhannah	21/8/35	19	"Home Devices" Competition	Miss D. Spoehr
Gladstone	20/8/35	65	"Women and Children of Russia"—Miss Bromham	Mrs. L. J. Sargent
Kybybolite	13/8/35	18	"Rock Gardens"—Mrs. E. Schinckel	Mrs. W. D. Kekwick
Taplan	16/8/35	11	Annual Meeting. "Knitting"—Miss E. Condon	Mrs. W. Flynn

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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences—1935.

Fruit (Non-irrigated), at Lyndoch, Tuesday, November 5th (J. S. Hammat, Secretary, Williamstown).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Minlaton, Wednesday, October 23rd.
Mount Gambier, Wednesday and Thursday, October 23rd and 24th.
Burra, Wednesday, October 23rd.
Lucindale, Saturday, October 26th.
Southern, Port Elliot, Saturday, October 26th.
Tatiara (Bordertown), Wednesday and Thursday, October 30th and 31st.
Millicent, Saturday, November 2nd.
Kingscote, Thursday, November 7th.
Oakbank, Saturday, November 9th.
Kalangadoo, Saturday, November 16th.
Angaston, Saturday, February 29th, 1936.
Mundalla, Wednesday, March 4th, 1936.
Mount Pleasant, Thursday, March 19th, 1936.

Black Cherry Aphis—Correction.

On page 166 of the September issue, sixth line, "usually about 30 per cent." should read "usually about 3 per cent."

S.A. Committee of Australian Dairy Council—Dairy Farm Competitions, 1935.

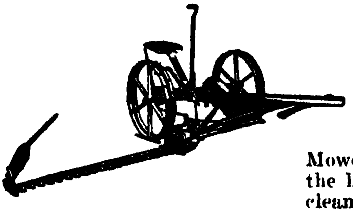
The South Australian Committee of the Australian Dairy Council, in conjunction with the Department of Agriculture, is conducting Dairy Farm competitions on the following lines, with sectional prizes for:—

1. Conservation of Fodder,
2. Pastures,
3. Dairy Herd,

And a prize for the competitor receiving the highest aggregate for all sections, in which will be included Farm Management, as detailed below:—

1. *Conservation of Fodder*—			
	Hay	60 points	
	Ensilage	60 points	
	Amount conserved per cow	60 points	
	Other crops	20 points	
			200 points
2. *Pastures*—			
	Condition, &c.	125 points	
	Management	75 points	
			200 points
3. *Dairy Herd*—			
	Breeding and Dairy Type	50 points	
	Condition, &c.	20 points	
	Sire: Pure bred	20 points	
	Ex tested Cow	10 points	
			100 points

A COMPLETE LINE of Quality-Built FARM EQUIPMENT



McCORMICK-DEERING OIL-BATH MOWERS.

With its entire operating mechanism—drive-gears, pawls, ratchets, clutch, and countershaft—operating in a deep bath of oil, the McCormick-Deering Oil-Bath Mower runs so sweetly that you can scarcely hear the hum of the knife. Simple, accessible, speedy, clean cutting—all working parts protected against dirt and grit. No farmer with a McCormick-Deering Oil-Bath Mower would ever be content without it. Made in 3½, 4, 4½, 5, and 6 feet sizes.

McCORMICK-DEERING HAYRAKES.

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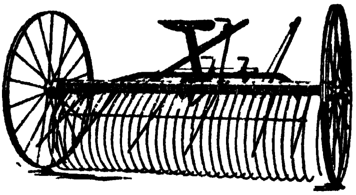

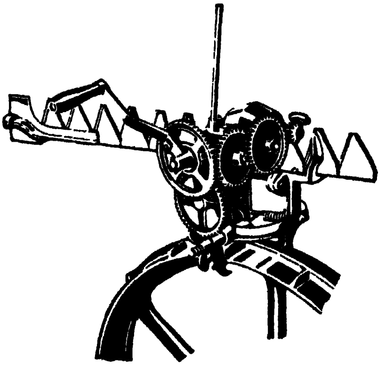

McCORMICK-DEERING KNIFE AND TOOL GRINDERS.

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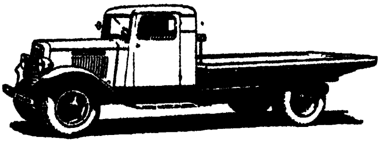
INTERNATIONAL MODEL C-30 TRUCK.



This 35cwt., 6-cylinder truck meets 75 per cent. of daily haulage requirements. Ample reserve power. Gross capacity, including body and payload, 55cwts. Full International quality.

INTERNATIONAL HARVESTER COMPANY
OF AUSTRALIA PTY. LTD.
(Incorporated in Victoria.)
113-114, North Terrace, Adelaide.

Farm Management (for consideration in Aggregate prize)—

Lay out, &c.	40 points	
Sanitation, &c.	40 points	
Records	20 points	
		100 points
		600 points

Any dairyman milking at least seven cows may enter for either sections 1, 2, or 3, and if entering for all three will then be eligible to compete in the aggregate prize for the best dairy farm.

For the purpose of these competitions, the State will be divided into three districts, namely:—

1. Adelaide Hills.
2. South-Eastern.
3. Murray Swamps.

In each District, certificates and first and second prizes to the value of £3 3s. and £2 2s. respectively will be awarded for sections 1, 2, and 3, as well as first and second aggregate prizes to the value of £3 3s. and £2 2s. respectively.

The judges will draw attention to the quality of the different herds, lay out of farms, cleanliness, &c., and the competitions should greatly assist the dairymen of this State.

Dates of closing of competitions are as under:—

Pasture Competition, 31st October, 1935.
Meadow Hay and Ensilage, 1st January, 1936.
Dairy Herd, 1st January, 1936.

Entry fee is 2s. 6d. per entry, and entry forms for the competitions and further particulars may be obtained from the Secretary, Mr. L. S. Smith, c/o Office of the Minister of Agriculture, Flinders Street, Adelaide.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

"Secretary, Agricultural Bureau, Balumbah," reports horse foundered after feeding on green oats in head.

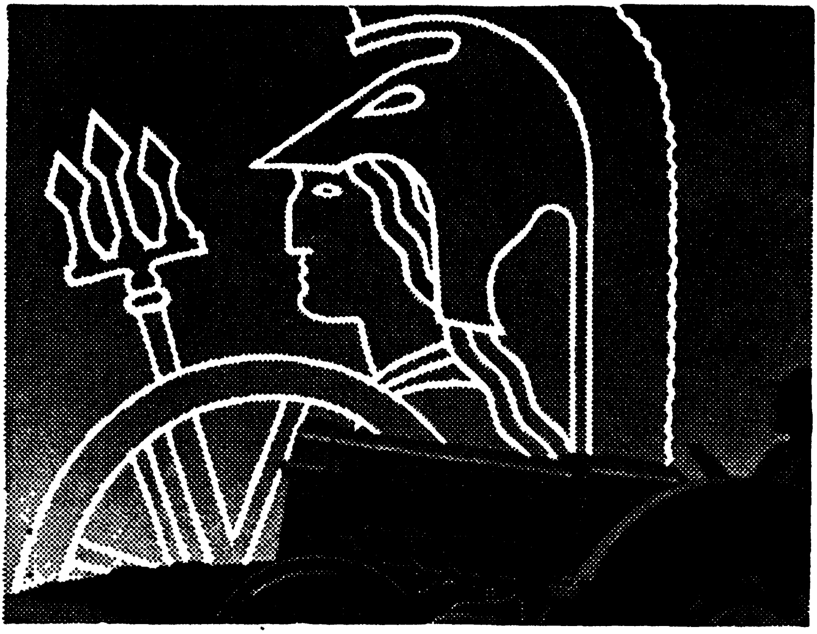
Reply—As soon as the symptoms were noticed the following treatment should have been given:—Drench of ¼lb. of baking soda dissolved in 2 pints of water, followed 2 hours after by 1½ pints of raw linseed oil. At this stage give the above treatment, lower the heels of the front feet by using a foot rasp to take the weight off the front of the feet, and then place the animal in water (sufficient to cover the feet as high as the fetlocks) all day, removing at nightfall to a soft bed of straw. Feed only on hay (with the heads removed) mixed with a little bran, and give 1oz. of baking soda twice a day for 3-4 days.

"Secretary, Agricultural Bureau, Warramboo," reports pigs scaly on back.

Reply—The colour of the pigs is not mentioned, and the condition may be due to wind or sun burn, eczema due to mange or lice, &c. It is suggested that the pigs be treated by applying, with a body brush, the following oily dressing:—Raw linseed oil, 1gall.; sulphur, 2lbs. Mix well and apply at intervals of four days. Sump oil from motor vehicles is sometimes used, but may blister the skin if applied in warm weather.

"Secretary, Agricultural Bureau, Blackheath," asks for information re *feeding of pollard dry to horses.*

Reply—No injurious effects should occur through feeding it dry with the chaff, but as horses work their feed with the lips, this tends to send the pollard to bottom of feeder; therefore it is suggested that the feed be slightly damped. Rock salt and ordinary coarse salt have the same value as a condiment, but rock salt is more economical to use.



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Britain buys Australia's primary products. Bear that in mind when you buy your tractor fuel. And as "C.O.R" Power Kerosene is British-Australian *and* gives more acres per gallon, isn't it the logical choice of the Australian tractor owner?

Obtainable in convenient 24-gallon drums

"C.O.R"

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ACTIVITIES AT ROSEWORTHY AGRICULTURAL COLLEGE, 1934-35.

Part I.—A GENERAL REVIEW WITH SOME THOUGHTS ON PRESENT CONDITIONS IN RELATION TO FARM MANAGEMENT.

[By Allan R. Callaghan, D.Phil., B.Sc., (Oxon); B.Sc.Agr. (Syd.) (Principal).]

INTRODUCTORY.

A lengthy and general report on the work of the College was published last year in six parts, and subsequently incorporated in a bulletin. Copies of this report have been handed to all farmers who visited the College, and some were sent by way of answering inquiries, especially those concerning silage making. There is abundant evidence to show that this comprehensive statement on College activities was well received and that, apart from acquainting farmers with the important work in progress, it was appreciated for its direct usefulness. An attempt will be made this year to emulate last year's report, but because of the striking contrast in seasonal conditions, and because of the development of work programmes only in their infancy last year, the year's activities offer much that is new. This is fortunate, for if there is one thing I am anxious to avoid in

Branches of the Agricultural Bureau make up parties to visit the College and review the Farm Activities. Last year between five and six hundred primary producers inspected the College in parties of from 20 to 80 in number.

the annual presentation of these reports it is the tendency merely to take the first as a copy and alter relevant details to suit the season's results; this leads to stereotyped statements which serve as nothing more than documentary records for the College archives. At the outset, therefore, I am committing myself to present an original and yet comprehensive statement, which is meant primarily as an extension service directly to assist the man on the land.

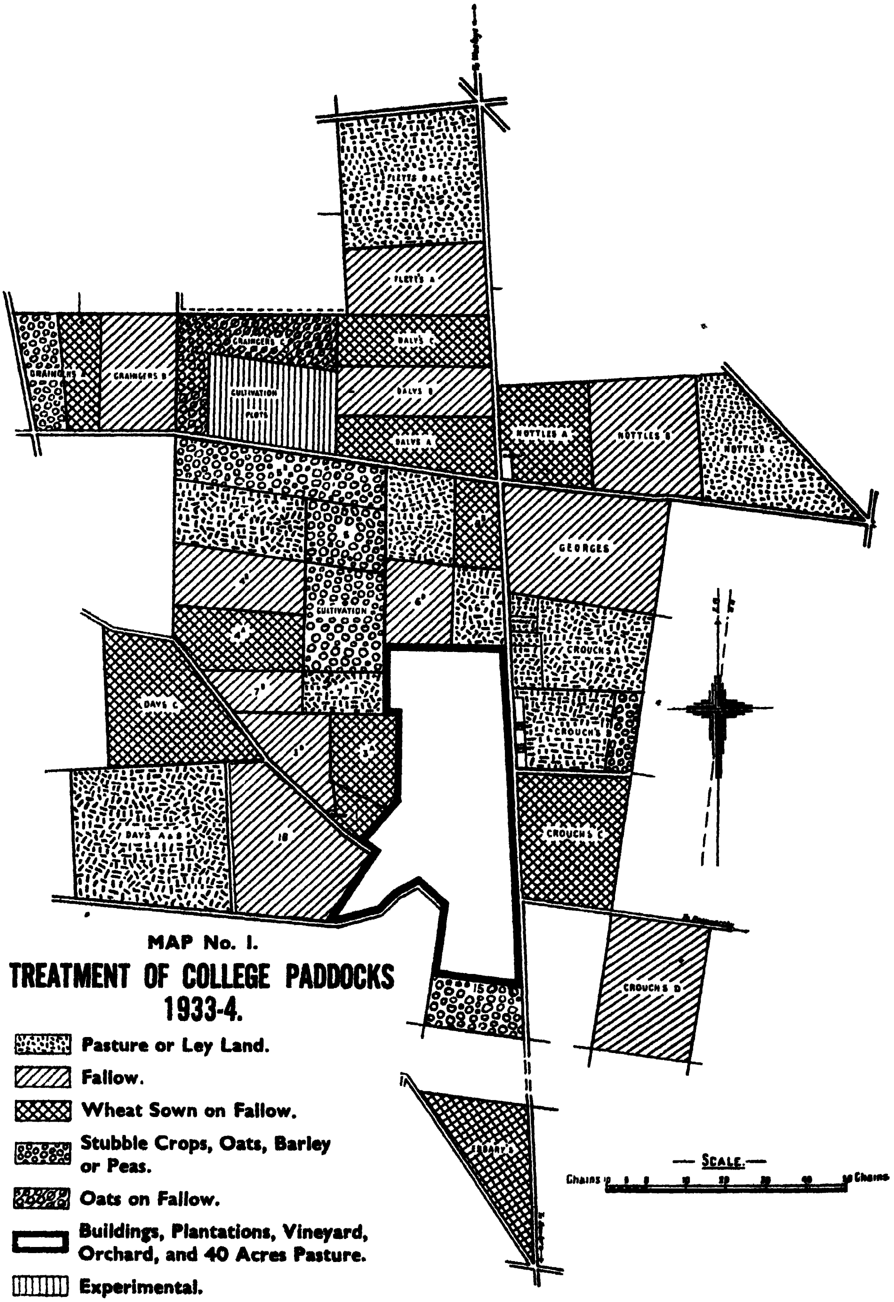
One of the main functions of the College is, after all, to practise the best methods, test others, and then disseminate information so gained to the primary producers concerned.

Last year between five and six hundred primary producers inspected the College in parties of from 20 to 80 in number, and there is every reason for believing that the number will increase as the work being done is more fully appreciated. A day spent in inspecting the College farm and livestock is something of a rush, and only a general impression with perhaps the absorption of a few outstanding details is possible, but by having available a full report on the previous season's activities to read at leisure, after having inspected the farm, ideas, general principles, details, and practical hints are crystallised, and the general scheme of management more fully discerned. So, apart from their general dissemination, these reports become useful handbooks for field days at the College.

The last year in primary production has witnessed no substantial improvements except in the lamb, pork, and bacon trades. The plight of the wheat market is still alarming; though wool values receded significantly, the outlook is at least hopeful. The farmer wholly dependent upon wheat cannot carry on financially successful with present costs of production and low returns; this, unfortunately, is so clear as to be perfectly obvious. Other interests must demand his attention, and one cannot help but feel that the most hopeful line of development is in fat lamb production, with its necessary adjunct, wool production. Then again, the pig industry has undoubtedly a future. Both these can become leading features on farms previously devoted to cereal culture, and apart from the financial advantages offered by such an increase in livestock activities the procedure is agriculturally sound and desirable, in fact in many cases I would say it is fundamental.

For many years now the College has fostered, advertised, and experimented with fat lamb production both for export and local consumption. Systems of breeding have been evolved and widely accepted, but granting all this, I believe the greatest service rendered has been in pioneering the practice of combining wheat farming with fat lamb production, in the agricultural areas. Pioneer work of this description is not spectacular, for by the time the full effects of such work begin to assert themselves the glamour of the original findings has died, simply because they become part of the store of common knowledge. It is a pleasure to note, however, the decided improvement in the general standard quality of sucker lamb marketed; it is not too much to look upon this as a reflection to some extent of the value of College experimental work and propaganda. Allow it, and it presents an incentive to continue with the good work and exploit more fully the possibilities of fat lamb production in the State.

If development of the fat lamb industry is to proceed in our agricultural areas farmers must realise that farming for their livestock is a better paying proposition than farming to grow wheat for less than 3s. a bushel. This entails to some extent a revolution in outlook for the average farmer, but if the practice is adopted, apart from better economic returns the farm will benefit from the practice. Selling animal produce from the farm is far more economical of plant food than selling in the form of plant produce, and to restore or even maintain the fertility level of the soils on the farm, the greater the number of livestock fed on the property the better.



MAP No. I.

TREATMENT OF COLLEGE PADDOCKS 1933-4.

- ░ Pasture or Ley Land.
- ▨ Fallow.
- ▩ Wheat Sown on Fallow.
- ▦ Stubble Crops, Oats, Barley or Peas.
- ▩ Oats on Fallow.
- ▭ Buildings, Plantations, Vineyard, Orchard, and 40 Acres Pasture.
- ▥ Experimental.

These introductory remarks are merely arguments in support of the urgent need for the adoption by farmers of a more diversified system, involving the extension of rotational systems, the realisation of the value of sown pastures, even of a comparatively temporary nature, the carrying of more livestock, especially sheep, and the conscientious realisation of the indispensability of a proper system of regular fodder conservation. All of these aspects are being carefully exploited by the College to the fullest extent circumstances allow and practical requirements warrant.

EXTENSION OF THE ROTATIONAL SYSTEM.

A study of the accompanying maps of the College property will convey to the reader the rotational system in general usage, but there are certain features of the rotations being followed which can only be appreciated by reviewing the farm as a whole and seeking the sequence in individual paddocks.

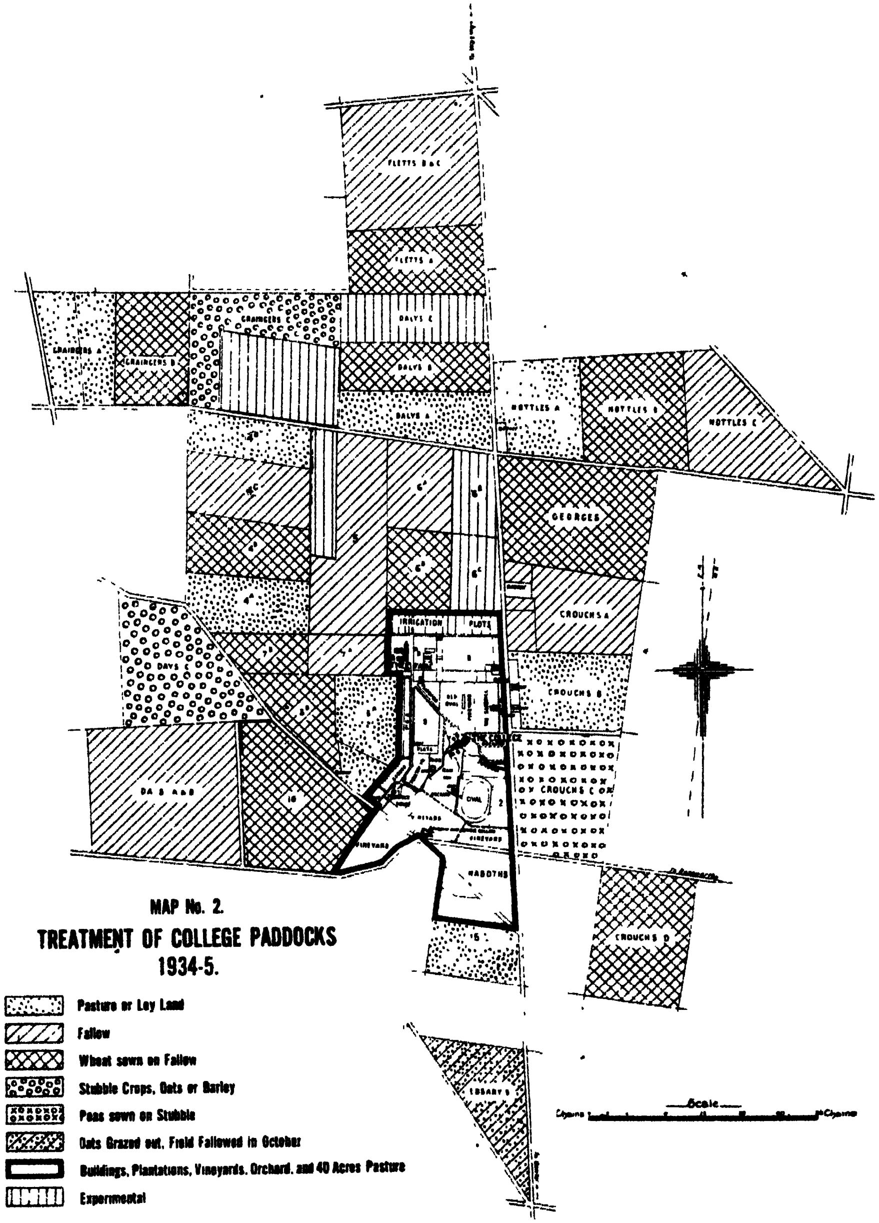
As already stated one of the main considerations of the moment on farms similar to the College property is the incorporation and extension of livestock activities; this entails farming to keep the livestock, and to do this it is imperative to overhaul and extend the rotations so that a greater area is available to stock. The College in the last three years has attempted to lead the way by developing a system which will give increased carrying capacity, and at the same time allow general farming to proceed even though wheat growing is in some measure curtailed, and which in doing so will restore the fertility level in the soil.

The main ideas are (i.) to incorporate crops which can be fed on the farm, (ii.) to rest from cropping altogether one or two paddocks over a period of say four or five years, and (iii.) to conserve as much fodder in the form of hay grain and silage as possible. The first of these calls attention to useful feed and storage crops and the two outstanding are oats and peas. The second is a matter of choosing pasture species suitable to the environment and establishing them in the most economical and practical method possible. Unless this is done paddocks turned out over a period of say four or five years revert to barley grass and other inferior species as soon as the residual effects of superphosphate are gone and the nitrogen level is restored by volunteer legume which after all comes in many areas in great profusion the first year a paddock is left as ley land. The outstanding species for the establishment of such temporary pastures at present appear to be wimmera rye grass, lucerne and the early strain of subterranean clover. Where the medics (volunteer "clover") do not come in of their own accord certainly early subterranean clover should be sown, but in districts where burr and other medics come with such regularity as they do at the College the sowing of early subterranean clover is unwarranted.

All the species mentioned can be sown with a cover crop and for the purpose the College is seeding oats at the rate of 30lbs. per acre, sown with wimmera rye grass, 2lbs., and lucerne 3lbs.; where early subterranean clover is necessary it could also be included, say at the rate of 3lbs. to 4lbs. of seed per acre. The cover crop can be grazed out, cut for silage or left for grain. The most effective treatment is not known but a comprehensive experiment is being carried out at the College from which conclusive results to indicate the best treatment are confidently expected.

By doing this during the year of establishment of the pasture the paddock is actually producing to almost full extent and the produce harvested enters into the fodder reserves which help satisfy the third main consideration.

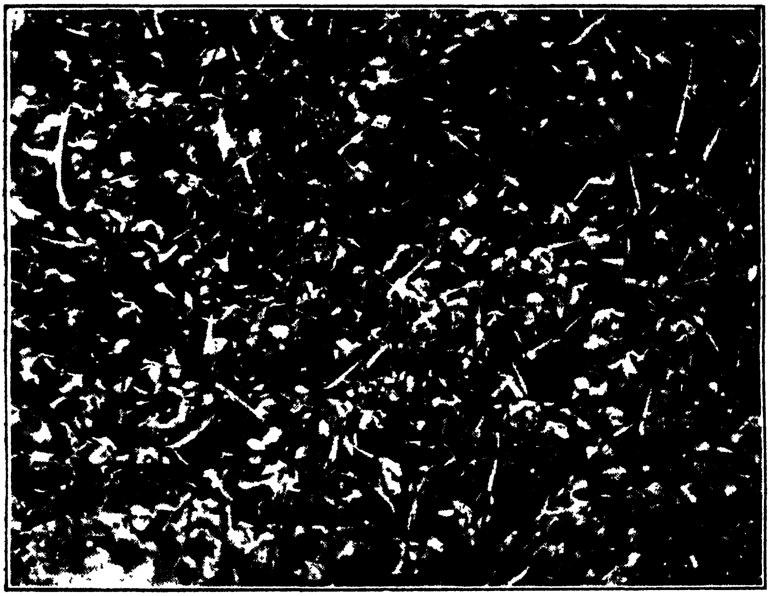
These ideas have been put into actual practice and the year just closed has been sufficiently successful to give confidence in their practicability, so that an outline of the procedure adopted will not be out of place.



MAP No. 2.
TREATMENT OF COLLEGE PADDOCKS
1934-5.

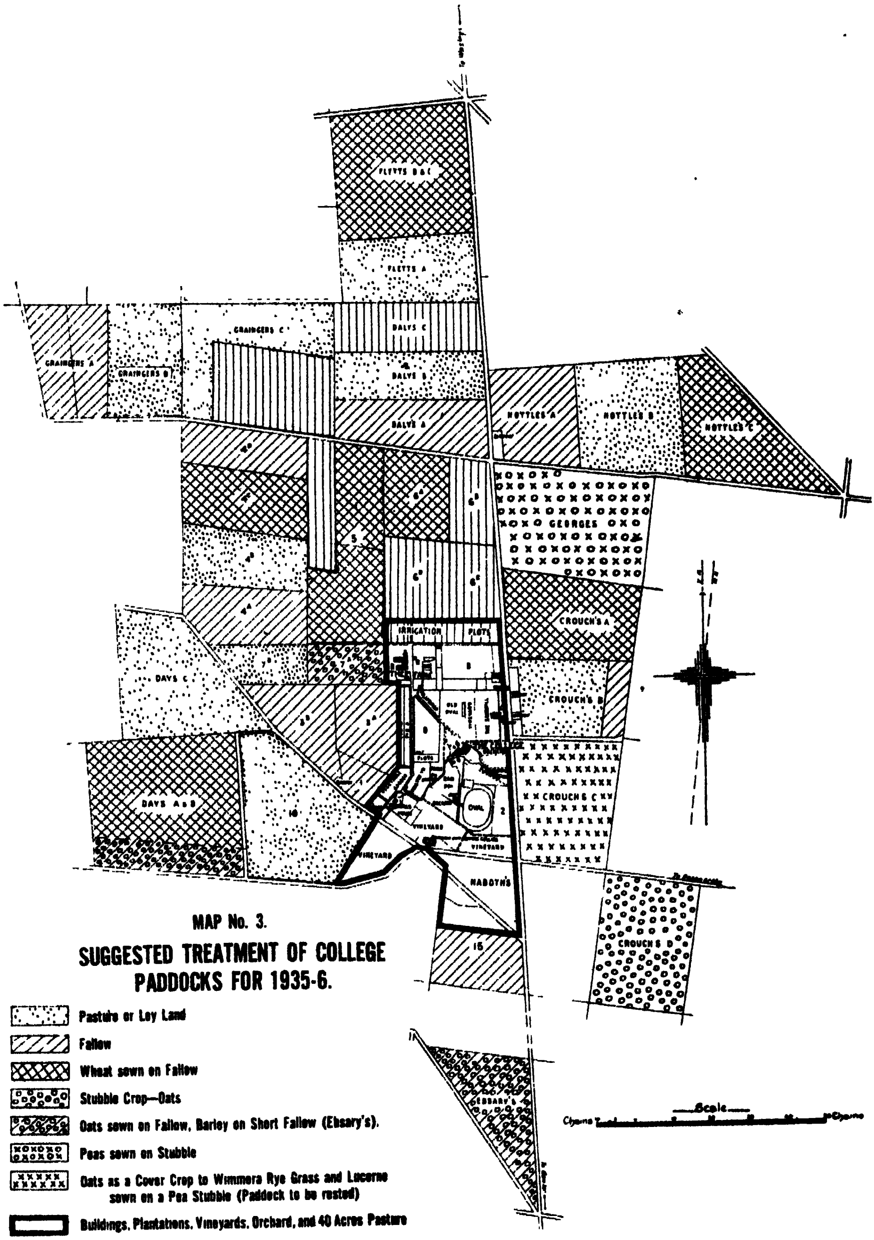
A paddock is chosen which has been cropped fairly heavily and which it is considered will benefit most from an extended rest. Following the wheat crop it is sown to peas. The peas are harvested and help considerably both to swell the fodder reserves and balance them from the dietary point of view. The pea crop is followed by oats sown as a cover crop to wimmera rye grass and lucerne, and is either grazed out or cut for silage. The paddock is then left to pasture for its extended holiday and is top dressed with superphosphate annually. Incidentally it is probably quite practicable to sow the pasture using peas as the cover crop.

An interesting practical point arises out of this rotation. The pea crop is scientifically well placed as it is sown on stubble land low in nitrogen and is followed by the oats as a cover crop which will take full advantage of the higher nitrogen level following the peas. Farmers object to the pea crop on the farm because they say it fouls the land and undoubtedly it is a dirty crop from the point of view of weed infested areas. As a result of this objection farmers are inclined to fallow for the peas, which is a waste, or they follow the peas with a fallow which is equally wasteful, or as a final alternative they leave peas out altogether, which is deplorable. In the rotation suggested above the peas are followed by a crop utilised for silage, and provided one can bear for a few months with the sight of a weed infested crop, the weeds are soon checked and actually utilised when the silage is taken off.



A splendid association of Early Subterranean Clover and Wimmera Rye Grass in Crouchs B. The pasture is now in its third year.

Now to follow this rotation on the College maps will be of interest. Take the paddock Crouchs C, in 1933 (Map No. 1) this paddock was sown to wheat. In 1934 (Map No. 2) it was sown to peas and in 1933 (Map No. 3) it was sown to oats as a cover crop to wimmera rye grass and lucerne. In 1936 it will be pasture. Refer now, on all three maps, to the paddock Crouchs B, and it will be noted that it has been under pasture all the time. Actually it was sown early in 1933 to wimmera rye grass and lucerne on one half and



MAP No. 3.

SUGGESTED TREATMENT OF COLLEGE PADDOCKS FOR 1935-6.

▨ Pasture or Ley Land
▨ Fallow
▨ Wheat sown on Fallow
▨ Stubble Crop—Oats
▨ Oats sown on Fallow, Barley on Short Fallow (Ebsary's).
▨ Peas sown on Stubble
▨ Oats as a Cover Crop to Wimmera Rye Grass and Lucerne sown on a Pea Stubble (Paddock to be rested)
▭ Buildings, Plantations, Vineyards, Orchard, and 40 Acres Pasture
▥ Experimental

to wimmera rye grass and early subterranean clover on the other half. (See Illustration 2). It stands now as a splendid demonstration of an established pasture of these species. It will be seen by referring to the paddock Georges that it is sown to peas, next year it will be treated the same as Crouchs C has been, in other words it is approaching its holiday. When Crouchs C enters on its rest, then Crouchs B will be fallowed, and so the process goes on.

Another interesting development which is evidenced in the maps (No. 7 and portion Days A and B in Map No. 3) is the departure from the recognised procedure of growing oats on stubble. Remember that under the system suggested it is necessary to farm for livestock. Why not grow oats on fallow? Actually oats to the farmer interesting himself in livestock, is a more important crop than wheat. By sowing oats early on fallowed land, excellent early grazing can be obtained and ultimately superior yields, payably so, obtained as a result of fallow. Incidentally oats for pure seed work must be sown on fallow for the best results.

LIVESTOCK CARRYING CAPACITY.

Accompanying the progress of the above evolution towards a more diversified scheme of farm management should be an increased livestock carrying capacity. Last year, unfortunately, a poor opening was followed by an exceedingly dry winter, with the result that feed was much below average, and crops grown for fodder reserves were short and lacking in bulk. To make matters worse stubble feed was unusually light. The sum total of these effects meant that heavy encroachments were necessary last year on the fodder reserves, but the significant feature is that in spite of the meagreness of the season's feed growth the carrying capacity of the College farm was increased according to schedule and a definite advance on the 1933-4 stocking was made, in point of fact the goal of one sheep per acre of total area was practically reached.

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To explain this more fully it is necessary to point out that the total area of the College farm is about 2,300 acres, but by excluding land occupied by buildings, vines, and orchard, plantations and scrub land which I think is legitimate, the area of agricultural or arable land is reduced to approximately 2,000 acres. Now for the year 1st April, 1934, to 31st March, 1935, which is the period under review, 604 acres were fallowed, 578 acres were rested as pasture or ley land, 737 acres were cropped and 60 acres sown for green feed. This gives a grand total area of arable land of 1,979 acres; although these large areas were used for cropping and fallow an equivalent of 1,882 sheep was carried in addition to the 50 working horses allowed for the normal working of the farm. So that although the cropping and fallow programmes occupied their usual large proportion of farm land, approximately one sheep to the acre was carried in addition.

The relevant livestock data for the last two years are given below by way of emphasising that in the face of a particularly lean year, and a full cropping and fallowing programme, the livestock carrying capacity of the farm was increased.

TREATMENT OF FARM AREAS IN RELATION TO THE LIVESTOCK CARRYING CAPACITY, ROSEWORTHY COLLEGE.

	1933-4. Acres.	1934-5. Acres.
Area fallowed	545	604
Area cropped	799	797
Area pasture or ley land	635	578
Total Area	1,979	1,979
Mean number of Sheep	939	1,096
Mean number of Cattle (including young stock)	99	90
Mean number of Horses (including young stock)	78	92
Equivalent in Sheep (after allowing for 50 working horses for farm operations)	1,703	1,882
Sheep per acre	0.86	0.96

The year was such that it was impossible to conserve any more than normal seasonal reserves of fodder, so that, taking into account the increased feeding necessary as a result of the dry season, reserves were considerably diminished. In other words it was a lean year, and contrasted sharply with the season of 1933-4 which was especially bountiful in feed and fodder. Fortunately full advantage of the good year of 1933-4 was taken when large quantities of silage, hay and grain were conserved. Actually it was conserved with the sole object of facing a poor year with confidence. This it did, for apart from enabling full utilisation of the luxuriance of the year before, it acted as a very secure insurance to the carrying capacity of the property. The past two years, indeed, have enabled the College to demonstrate clearly this most important advantage fodder conservation offers, for not only did it permit the maintenance of normal carrying capacity, but it actually enabled an increase to be effected in a year well below average from the point of view of feed and fodder grown.

An attempt has been made herein to convey a general impression of the work undertaken, together with the leading features of management, as a preface to the more specific aspects which are to follow. It is intended, in subsequent instalments, to deal with the details of all phases of farm operations, including experimental work, which are considered of sufficient significance, or which have advanced sufficiently far to warrant publication.

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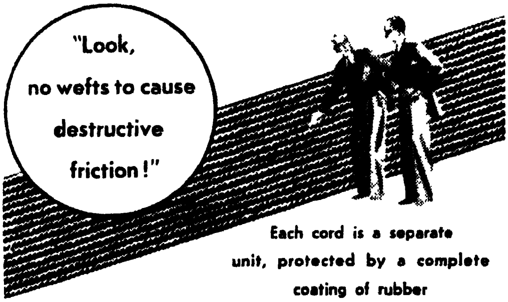
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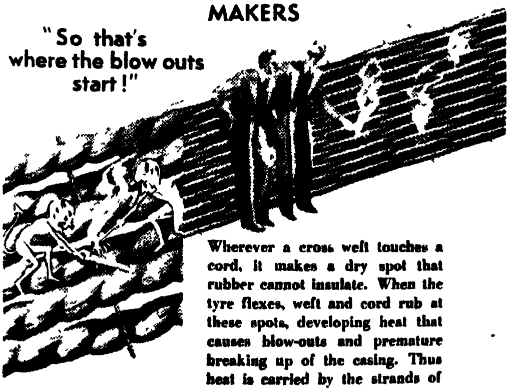
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TURRETFIELD SEED WHEAT FARM.

[By R. C. Scott (Supervisor of Experimental Work) and F. E. Waddy (Farm Manager.)]

The chief function of the Turretfield Farm is the production of pure and prolific lines of seed wheat for disposal to farmers.

This work has been in progress for three seasons, and, although the complete course of selection and development is not yet in full operation, considerable improvement in the quality of the grain offered for sale has been effected.

Each year a steady advance in this direction has been made, but it is not until seed built up from that harvested from the stud plots is available for distribution that the highest standard will be attained.

However, notwithstanding this fact, there has been a ready demand for the seed wheat offered and farmers are appreciative of the work done.

Homestead on Turretfield Seed Wheat Farm.

An excessive charge for the selection and graded grain is not made, and during the past two seasons a price of 3s. 4d. per bushel has been fixed.

Tentative orders are accepted many months in advance, and, in fact, some have already been received for delivery from the coming harvest. These, of course, are subject to confirmation when the charge for seed for the current year has been decided upon.

The Farm is conveniently situated, being about 35 miles to the north of Adelaide and 10 miles in a north-easterly direction from Gawler. The total area is 1,604 acres, but the whole of this is not available for cropping.

Portion consists of relatively rough hilly country which provides really good grazing, but does not admit of tillage operations, whilst much is lost because of the fact that the North Para River and Salt Creek both run through the property.

The result is that, when the area occupied by buildings, plantations, etc., is also taken into consideration, it is found that about 1,250 acres are available for cropping purposes. This is worked on a three-year rotation, the cereal crop being followed by pease, oats for grazing, or natural pasture, with the result that about 400 acres are fallowed for wheat each year and the pasture consumed by a fat lamb breeding flock.

On the average, the soil is of a red loam type with some calcareous patches, whilst the flats adjoining the river are more or less silty in nature. At the same time, there are appreciable areas where the red clay predominates, and as these tend to run together and set hard after rain, they frequently offer serious difficulty to young germinating cereal crops.

The 1934 Season.

Particulars of the rainfall recorded at Turretfield for the last three years comparatively with the average for the 1908-34 period are shown in the following table:—

Rainfall at Turretfield.

	1932. Ins.	1933. Ins.	1934. Ins.	Means 1908-34. Ins.
January	0.45	1.44	0.36	0.55
February	0.99	0.13	—	0.70
March	0.92	0.57	0.36	0.74
April	2.60	0.92	1.94	0.86
May	1.14	3.04	0.12	2.32
June	4.00	0.59	0.97	2.14
July	2.27	1.55	1.94	2.06
August	2.44	2.67	2.37	2.13
September	1.71	3.29	2.93	2.34
October	2.29	0.72	2.04	1.69
November	0.34	0.36	2.16	1.01
December	0.89	1.05	0.30	0.94
	20.04	16.33	15.49	17.48

"Useful" Rainfall.

	1932. Ins.	1933. Ins.	1934. Ins.	Means 1908-34. Ins.
Seeding rains (April-May)	3.74	3.96	2.06	3.18
Winter rains (June-July)..	6.27	2.14	2.91	4.20
Spring rains (August-October) ..	6.44	6.68	7.34	6.16
Early summer rains (November).	0.34	0.36	2.16	1.01
Total	16.79	13.14	14.47	14.55

The total rainfall for 1934, namely, 15.39 inches, is the lowest recorded since the farm has been conducted on a Seed Wheat basis and is slightly more than 2 inches below the mean for the past 27 years.

However, the "Useful" rain practically equals the average, and it is remarkable to note that from a total of 15.39 inches, 14.47 inches, or 94 per cent., fell during the growing period of the crop.

Reviewing the climatic conditions during the past year, it may be said that generally speaking the April rains were satisfactory, but at the same time they were of a very patchy nature, and certain fields, particularly No. 16, missed showers, whereas adjoining paddocks received quite appreciable falls.

The exceptionally dry weather experienced during the months of May and June, in which the rainfall was 337 points below the average, was not favourable for the growth of crops.

In some areas the grain planted late in the seeding period germinated very irregularly, and some malting occurred, causing a certain amount of resowing to be resorted to. This was especially the case in Field No. 16, which did not receive good rains in April.

Both the spring and early summer rains were above average, with the result that crops more or less recovered from the setback received in May and June, and made strong vigorous growth. Ultimately the plants developed well-filled ears, carrying full plump grain which graded out to a very attractive sample of seed wheat.

WHEAT HARVEST.

The wheat crops were planted on well-prepared fallow land from mid-May to mid-June. The rate of seeding varied between 75 and 80lbs. per acre whilst with the exception of Field No. 4A, which received 120lbs., was dressed with 156lbs. of superphosphate to the acre.

The yields secured are shown in the following table:—

Wheat Yields, Turretfield, 1934-35.

Field No.	Variety.	Acreage.	Total Yield. Bush.	Total Yield. Lbs.	Acre Yield. Bush.	Acre Yield. Lbs.
4	Nabawa	41.64	1,197	0	28	42
4 A	Ford	34.50	967	30	28	2
11	Sword	42.69	1,114	40	26	5
4	Ghurka	44.42	1,155	35	26	1
11	Ranee 4 H	32.29	822	36	25	28
11	Sultan	15.77	301	0	19	5
16	Federation	23.91	372	11	15	33
16	Waratah	44.24	673	0	15	13
16	Gallipoli	26.73	303	4	11	21
		306.19	6,906	36	22	33

In addition to the above, 30.76 acres of land were occupied by Stud Wheat plots, Selection plots, &c., and from this area 282bush. of wheat and 27bush. of barley were harvested.

The acre yield of 22bush. 33lbs. is slightly better than that for 1934, when the mean return from 348.04 acres was 20bush. 36lbs. per acre.

It is not possible to make a fair comparison between the yields from the individual varieties, because they were planted in different fields and under vastly different soil and moisture conditions.

For example, in Field No. 16 a considerable amount of malting occurred, and it was therefore necessary to resow these patches in the middle of July.

Although this resowing much improved the ultimate yield, the averages from this field were poor, and consequently the returns from Federation, Waratah, and Gallipoli do not compare favourably with those obtained from Fields No. 4 and 4 A, where a strong healthy germination was secured.

With the exception of Gallipoli, all the grain produced was graded and sold as seed. The demand was very pleasing, some varieties being quickly sold out, with the result that, although orders were limited to a maximum number of bags, many could not be accepted.

Approximately 200 farmers, situated in almost every district of the State, were supplied with seed, and there is no doubt that the distribution of this selected grain must be of enormous benefit to the wheat-growing industry generally.

The varieties planted this year, seed of which will be available after the coming harvest, are Sword, Ford, Ranee 4 H, Sultan, Federation, Nabawa, Waratah, and possibly Dundee. Seed of the latter variety was purchased from the Wagga Experimental Farm in New South Wales, and if it reaches the Turretfield standard for purity, will be included in the varieties offered for sale in 1936.

HAY HARVEST, TURRETFIELD, 1934-35.

The great bulk of the Hay area comprised headlands and divisions cut between varieties. In all 198 tons were stacked, including 68½ tons from stubble land planted with oats for grazing purposes.

The individual yields from the fallow land are tabulated below:—

Field No.	Variety.	Acreage.	Total Yield.		Acre Yield.		
			T.	C.	T.	C.	L.
8	Sword	17.5	51	0	2	18	22
4 A	Ford	2.5	6	10	2	12	0
11	Sword, Sultan, Ranee 4 H	17.2	44	10	2	11	83
4	Nabawa, Ghurka	4.96	12	0	2	8	43
16	Federation, Waratah, Gallipoli	14.6	15	10	1	1	26
	Total	56.76	129	10	2	5	59

In addition to the above figures, 68½ tons of Oaten Hay were cut from 44.4 acres of stubble land in Fields Nos. 7 and 15. This area was planted for the purpose of providing grazing for livestock, and after having been regularly fed off until late in the season, was eventually allowed to develop for Hay, returning 1 ton 10cwts. 96lbs. of good quality fodder per acre.

This Oaten Hay (as chaff) is always fed to the horses whilst the fallows are being worked over after harvest and during the seeding period, in order to minimise the danger of strange wheat grains being introduced through the droppings of the animals and thus causing impurities in the wheat varieties to be offered for sale as seed.

FODDER CROPS.

The natural pasture does not make rapid growth in the stubble land at Turretfield, and each year it is the practice to drill cereals, chiefly Oats, on these areas.

In addition, 48 acres of White Brunswick Pease were planted in Field No. 15, and these crops provided excellent grazing for the ewes and lambs until late in December.

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THE BRANDING OF LIVESTOCK.

[By H. O. LAURENTI, Registrar of Brands.]

[*Paper read at the 46th Congress of the Agricultural Bureau of South Australia.*]

As the Brands Act of 1933 includes many important amendments which are of great interest to stockowners generally, and for the information of members attending the 46th Annual Congress of the Agricultural Bureau it has been decided to give an outline of the legislative enactments and details of requirements expected from stockowners in respect of the branding of stock.

All previous measures in connection with the legislation of brands have been repealed, and the new Brands Act is a consolidating Act incorporating the principal provisions of the previous Acts, with various amendments.

NOT COMPULSORY TO BRAND.

The Brands Act of 1933 was framed for the protection of stockowners. Under its provisions and for a nominal fee, brands and earmarks may be registered. It is unwise for an owner to allow his stock to remain unbranded. It is not compulsory to register a brand or earmark, but any person branding stock without registration is liable to a penalty.

If an owner wishes to register a brand for horses, cattle or sheep, he may apply to the Registrar of Brands, who will supply him with the necessary information.

An important point to remember is that, after having registered a brand, if at any time there is an alteration of address, it is necessary to notify the Department. By failing to do so, there is the liability of the brand being cancelled.

HORSE AND CATTLE BRANDS.

Under the Act, "horses" include asses and mules, "cattle" includes camels. Any person may obtain a horse and cattle brand for his exclusive use. The brand shall consist of one letter and two numerals or one sign with or without two numerals. A single sign brand may be registered, the fee being £2.

The Act provides that only one horse and cattle brand may be registered in the name of any person, unless he is the proprietor of more than one run. In such a case, the Registrar of Brands is empowered to register a separate brand in respect of each run. It is further provided that every owner of horses and cattle shall use the same registered brand on both horses and cattle.

Size of Brands.

The size of a brand on horses and cattle shall not be less than 1½in. or more than 3in. in height, with one exception—when a brand consists of a letter within a sign (as registered under the Brands Acts that have since been repealed), the brand may be 4in. in height.

Order of Rotation of Brands.

Position and Order of Rotation of Brands on Horses.

First position	Near shoulder
Second position	Off shoulder
Third position	Near quarter
Fourth position	Off quarter
Fifth position	Off saddle or off ribs
Sixth position	Near saddle or near ribs

Position and Order of Rotation of Brands on Cattle (other than Camels).

First position	Off rump, hip, and thigh
Second position	Off ribs
Third position	Near rump, hip, and thigh
Fourth position	Near ribs
Fifth position	Near shoulder
Sixth position	Off shoulder

Position and Order of Rotation of Brands on Camels.

First position	Near neck
Second position	Off neck
Third position	Near thigh
Fourth position	Off thigh

Contrary to the practice which applies to the registration of sheep brands, a horse and cattle brand is registered without a fixed position being allotted, but the brand shown on the certificate must be used in the position as set out in the order of rotation; that is, if stock have been previously branded, every subsequent brand shall be placed on the position next in order of rotation to the last brand placed on the stock. For instance, if a horse is branded on the second position (off shoulder), the next position to brand would be the third position (near quarter). If the last position is taken, the first will be next in order of rotation. On clean skins (stock that have never been branded), the owner may use any one of the six positions he so desires. It does not follow that if he brands a clean skin on a certain position he is compelled to brand other clean skins on the same position. If he has, say, six clean skins to brand, he may, if he wishes, use a different position for each. The important point is to remember that the last position used denotes ownership. Every precaution should be exercised when branding stock previously branded that the correct order of rotation is followed out. Should you lose your horse and the last brand (being your brand) on the animal in order of rotation was on the off shoulder, you could claim ownership. If the horse was found and branded on the next position (near quarter), the person branding on this position would have to produce evidence showing that he legally obtained the horse from the owner of the brand on the previous position, that is, on the off shoulder.

The Use of Numerals for Horses and Cattle.

The owner of a registered brand for horses and cattle may apply for registration of distinctive numerals for stud or herd book purposes, to be used on any one of the following positions as set out in the margin of the certificate:—For horses, near or off neck, near or off thigh; for cattle, near or off ear, near or off horn, and near or off neck. The numerals to be used will be consecutive, that is, 1-100 and upwards.

Under the Act, the owner of a registered brand for horses and cattle is granted the concession of using numerals for denoting age without registration and without payment of fee, provided the horses and cattle have not previously been branded, and he may use any numerals immediately under his registered brand. The numerals must not be less than 2in. nor a greater distance than 3in. immediately under the brand. The numerals must not exceed 3in. in height.

Distinctive Brands and Marks.

An owner of a registered horse and cattle brand may register a distinctive brand or earmark for special purposes, such as denoting class, age or description, or for private reasons. If the owner desires to mark his stock only with a distinctive brand or earmark, he can do so without using his registered brand, or *vice versa*. The positions for distinctive brands and earmarks are as under:—

Horses.	Cattle.
Near neck	Near neck
Off neck	Off neck
Near cheek	Near cheek
Off cheek	Off cheek
Near ear	Near loin
Off ear	Off loin
	Near horn
	Off horn
	Dewlap
	Near ear
	Off ear

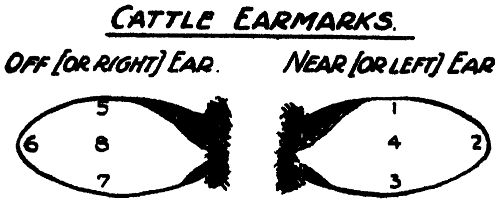
Distinctive brands must be used only on the position as shown on the Certificate of Registration.

Earmarks for Cattle.

Earmarks for cattle must be registered. All earmarks must be made with pliers, the use of a knife being prohibited, except when making a slit. The size of an earmark on cattle must not exceed one-third of the ear. To crop or use a straight cut is illegal. To crop is regarded as a "rogue's mark." By using a crop or straight cut any legal earmark may be removed. Without exception, a registered earmark on cattle can be used only on condition that both ears have never been marked. The reason for this is that earmarks are registered on either one or both ears. A person may think that if he buys cattle that are marked on the near ear only, he can use his earmark, which is for the off ear. He overlooks the fact that by so doing he converts it into the earmark of a person who has registered a mark on each ear. Therefore, an earmark on cattle can be made only when both ears are clean or not marked.

For the registration of earmarks the ears are divided into eight positions, namely:—

1. Front or top of near ear.
2. Point or tip of near ear.
3. Back or bottom of near ear.
4. Centre of near ear.
5. Front or top of off ear.
6. Point or tip of off ear.
7. Back or bottom of off ear.
8. Centre of off ear.



Two marks on one position; mark nearest head to be read first.

Under the Act, the "near ear" means on the left side and the "off ear" means on the right side of the animal.

Branding Irons.

Every care should be taken to see that the branding iron is made to agree in every particular with the brand stamped on the margin of the certificate. The face of the brand should be absolutely level, so that, when impressing the branding iron on the animal, all parts of the brand should touch the skin simultaneously. If the brand is made irregular or uneven, the first portion that touches the skin has to be burnt through to the flesh before the full impression is made. Faulty branding irons are cruel to the animals and, in addition, injure the hide to such an extent that there is an unnecessary economic waste of leather. Well-made and even-surfaced brands of sizes prescribed under the Act applied with contact sufficient only to destroy the hair roots will leave a plain and permanent brand, and will not damage the hide or cause the animal unnecessary pain. Fortunately, the conditions of branding, as far as this State is concerned, have been improved. Local tanners have expressed their appreciation of this fact. When it is noticed that stock or hides or leather are badly branded, the owner is communicated with and it is pointed out to him that he is liable to a penalty under the Act. The result is that faulty branding is remedied, thus saving a needless waste of leather. Brands should not be made too large. Letters and numerals 2½in. in height are quite large enough. For young stock, 2in. letters are ample.

EXPORT BRANDS FOR HORSES.

A special brand for horses for export may be registered. The brand must consist of one or more letters or signs or a combination of letters and signs, with a dot impressed to the left of and on a line with the lower part of the brand. The brand must be used in the position stated on the Certificate of Registration, and the size of the dot must not be more than 1in. and not less than ½in. in diameter.

SHEEP BRANDS.

Sheep Brands Districts.

Under the new Act, the sheep brands districts have been increased from four to six, and are as follow:—

No. 1. South-Eastern District, consisting of the counties of Albert, Alfred, Russell, Buccleuch, Chandos, Cardwell, Buckingham, MacDonnell, Robe, and Grey.

No. 2. Western District, consisting of all territory in the State enclosed by a line commencing at the south-eastern corner of the county of Manchester; going thence westward and northward along the northern boundaries of the counties of York, Buxton, LeHunte, the eastern boundary of the county of Robinson, the eastern and northern boundaries respectively of the counties of Dufferin and Way, the northern boundary of the county of Kintore, the eastern and northern boundaries of the county of Hopetoun, to the 132nd degree of longitude; thence northward to the 30th degree of longitude; thence westward to the western boundary of the State; thence southward to the sea-coast; and thence along sea-coast returning to the point of commencement.

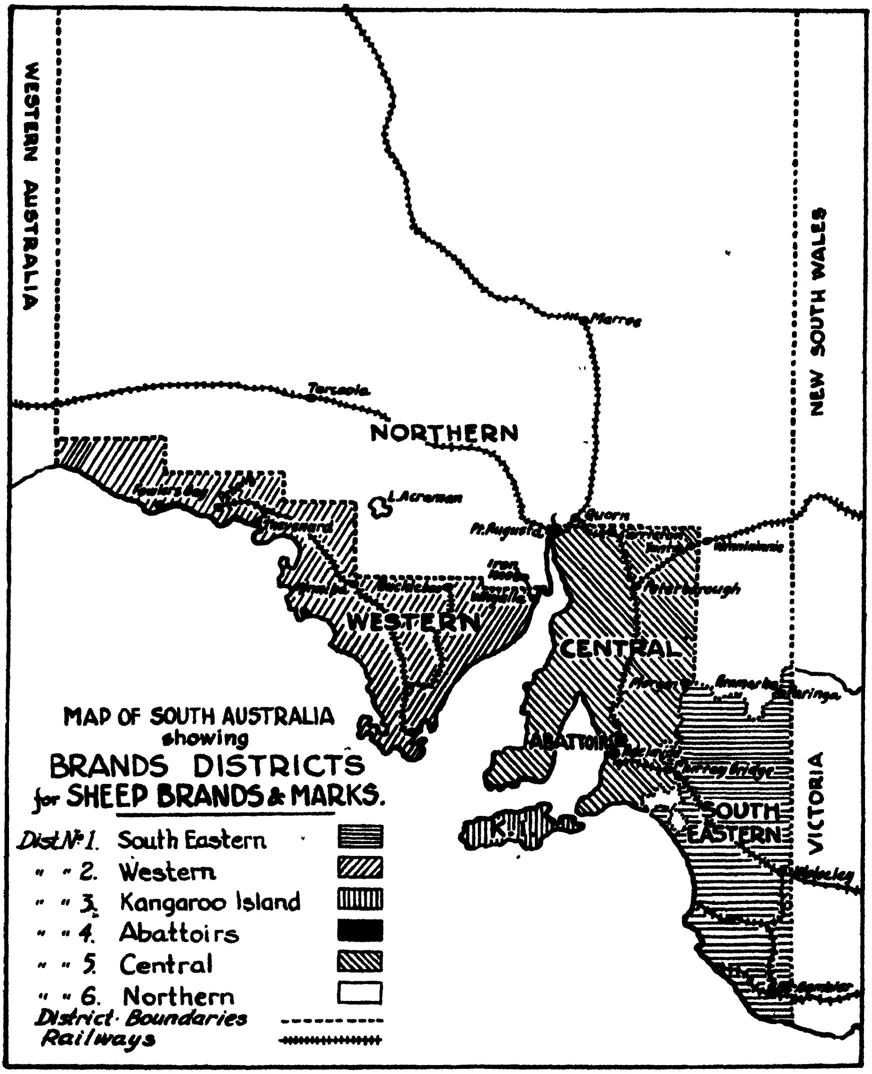
No. 3. Kangaroo Island District, consisting of the county of Carnarvon.

No. 4. Abattoirs District, consisting of all the land in sections 97 and 720, hundred of Yatala, which is vested in the Metropolitan Abattoirs Board.

No. 5. Central District, consisting of the whole of the counties of Frome, Dalhousie, Herbert, Kimberley, Victoria, Stanley, Burra, Daly, Fergusson, Gawler, Light, Eyre, Adelaide, Sturt, and Hindmarsh.

No. 6. Northern District, consisting of the whole of the State not included within any of the districts above described.

The map hereunder will give, perhaps, a better impression as to the location of the various districts in the State.



Registered Paint Brands.

Under the Act, "sheep" include goats. Any owner of sheep may register a paint brand for his exclusive use. The same paint brand may be registered to any other person if in another district. Two or more paint brands, although consisting of the same design, may be registered if in different positions or colours. The four positions are top of shoulders, near ribs, off ribs, and rump. The colours commonly used are black, red, blue, and green. Therefore, it is possible to register in one district a brand of exactly the same design for 16 different sheep owners.

by varying the positions and colours. Only one sheep brand shall be registered to any owner, unless he is the proprietor of more than one holding, run, or station. The size of a registered sheep brand must not be less than 2in. nor more than 4in. in height, unless the brand consists of a letter within a sign, in which case the brand may be 5in. in height. If the brand consists of a dot, it shall not be less than 1in. nor more than 2in. in diameter. Tar is injurious to wool and is, therefore, prohibited under the Act. A paint brand shall only be made with oil paint. The owner of a registered sheep brand may use any of the numerals from two to nine on his sheep in paint on any position as a distinctive brand for his sheep, provided that he uses only one of such numerals on any one sheep, and the numeral as used shall not exceed 4in. in height. If sheep already branded with a numeral are purchased it does not debar the new owner the right of using a numeral. Tags may also be attached to the back of the off ear of female sheep and the near ear of male sheep, the one ear of each sex being reserved for registered earmarks which will be referred to later. The same ear as is used for tags may be used for private earmarks, without registration, by a person who is a registered owner of a sheep brand. Many owners of sheep are under the impression that if they purchase sheep that have been previously branded on their registered position they can brand the sheep on another position. This is entirely incorrect, as a registered sheep brand can only be used on the position set out in the Certificate of Registration. If a sheep owner obtains sheep that are branded on the position allotted to him he should not use his **registered brand.** Should he do so he will render himself liable to a penalty for a breach of the Brands Act. For instance, owing to the numerous combinations of sheep brands registered, a person branding sheep with his registered brand next to the brand on his allotted position will probably convert it into a registered brand in the name of some other person, thus committing an offence under the Act. It may also lead to other complications, such as blotch branding. The alternative is that, instead of using his registered brand, he may use any one of the numerals from two to nine on the sheep in any colour paint and on any position. To obviate unnecessary branding, if an owner intends to dispose of or sell his sheep soon after shearing, or for any other reason, he may use a numeral instead of his registered brand.

Care in Making Sheep Brands.

Sheep brands should be well made, so that the brand comes out distinctly on the sheep. Three-inch brands are a popular size. The letters should be well spaced. To prevent blotching or smudging, the face of the brand should be flat with the edges bevelled or made with a round surface.

Tattoo Marks.

An owner of a registered sheep brand may register a tattoo mark. Unlike paint brands, there is no fixed position for tattoo marks. Provided that there is no tattoo mark on the sheep, any one of the following positions may be used:—

First position	Near or left ear
Second position	Off or right ear
Third position	Underneath part of the tail
Fourth position	Inside near or left forearm
Fifth position	Inside off or right forearm
Sixth position	On the inner side of the near or left hind leg
Seventh position	On the inner side of the off or right hind leg
Eighth position	On near brisket
Ninth position	On off brisket

If there be a previous tattoo mark on the sheep, the next position in order of rotation should be used. The last position used in order of rotation shall prove ownership.

Registered Earmarks and Firebrands.

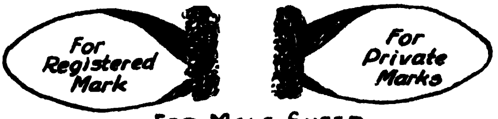
The owner of a registered paint brand may obtain the registration of:—

(*a*) An earmark;
(*b*) A firebrand.

In addition to the earmark or firebrand being registered in the name of the person, it is also registered for the run or farm on which the mark is being used. Upon ceasing to be the proprietor of the run or farm, the earmark or firebrand shall be deemed to be cancelled, unless steps have been taken to have the earmark or firebrand transferred to the new owner. An earmark or firebrand shall be registered for exclusive use in the sheep brands district within which the farm is situated. Only one earmark and firebrand shall be registered, unless the owner is the proprietor of more than one run, in which case, at the discretion of the Registrar, a separate earmark and firebrand may be registered for the additional properties. Every registered earmark for sheep shall, in the case of male sheep, be placed on the off or right ear, and in the case of female sheep, on the near or left ear. As previously stated, earmarks may be used on the off or right ear of female sheep and the near or left ear of male sheep without registration by the owner of a registered sheep brand. In any case, no earmark shall exceed ¾in. in length or ½in. in width or diameter unless such earmark is a slit, which may be 1¼in. in length from the tip of the ear. If sheep have previously been earmarked with a registered earmark, no person shall place any other earmark on such ear. As in the case of cattle, to crop the ear of any sheep is an offence under the Act, and persons having in their possession sheep with their ears illegally earmarked or cropped are liable to prosecution. The diagrams hereunder will serve to illustrate the ears reserved for registered and unregistered earmarks for sheep; also the positions in which the marks are used.

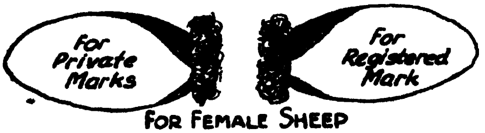
SHEEP EARMARKS

OFF [OR RIGHT] EAR. : NEAR [OR LEFT] EAR



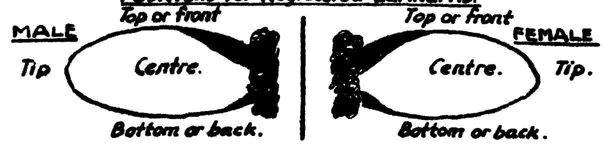
FOR MALE SHEEP
[Rams or Wethers]

OFF [OR RIGHT] EAR : NEAR [OR LEFT] EAR.



FOR FEMALE SHEEP
[Ewes]

Positions for Registered Earmarks.



The positions for a registered firebrand are determined by the Registrar of Brands, and shall be placed on the face or horn of the sheep and shall not exceed 1½in. in height.

STUD-STOCK BRANDS.

For the benefit of stud-stock owners, provision has been made for the registration of special stud-stock brands. If a person satisfies the Registrar of Brands that he is a member of an association which has been formed for the purpose of encouraging the breeding of pure-bred stock, he may apply for the registration of a brand. A stud-stock brand may be granted to a person who is not the owner of any registered brand for horses, cattle, or sheep. The owner of a stud-stock brand may without registration use any one or more of the numerals 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 in any position as a distinctive brand for his stud stock.

POUND BRANDS.

Pound brands are registered without fee in the name of every public pound in the State. For horses and cattle, a triangle with two numerals is issued and, for sheep, a green broad arrow on the top or back of the head. If stock are sold in pound, they must be branded with the brand of such pound before delivery. It is the duty of every poundkeeper, when horses and cattle are impounded, to notify the owner of the registered brand last in order of rotation of the fact and, in the case of sheep, to notify the owners of every registered brand which appears on the sheep. If a poundkeeper neglects to give notice to owners, as required by the Act, neglects to brand horses, cattle, or sheep sold out of pound, or refuses to give any necessary information within his knowledge when requested by an inspector or police officer, he shall be guilty of an offence under the Act.

TRANSFERS OF BRANDS.

When a person dies, his registered brand may be transferred by the executors or trustees of the deceased. Provision is also made for a person who has no further use for his brand to apply to have it transferred to another person. It is a common practice for brands to be used without first having been transferred. In an estate where everything in the deceased's will is left to the sons, the impression is that the sons can continue using the brand without first having it transferred to their names. By so doing they are liable to a penalty for a breach of the Act. This also applies to a person who has sold his farm or business. The buyers, or new owners, cannot use the seller's brand without first having it transferred. The Registrar may, at his discretion, refuse to transfer the registration of any brand or mark. Sheep brands, tattoo marks, sheep earmarks, and sheep firebrands can only be transferred for the district in which they are registered.

CANCELLATION OF BRANDS.

An important amendment in the present Brands Act is the cancellation of all brands after advertising within a prescribed time (not less than six months after the first publication of the notice of cancellation), unless the owner applies in writing for the retention of the brands registered in his name. When making application to retain brands, no fee is payable. The reason for this amendment was to cancel brands that were not in active use and to bring the department's records up to date. This amendment was brought into force in June, 1934, and, after the necessary notice had been given, approximately 20,000 brands and marks were cancelled, as the owners did not apply for their retention. Under the circumstances, if owners who failed to apply wish to have their brands re-allotted, it will be necessary for them to pay the fees as prescribed under the Act. So as to safeguard the interests of persons who may have overlooked the fact of applying for the retention of their brands, it has been decided not to re-issue such brands until five years after they have been cancelled.

REGISTERS, QUARTERLY STATEMENTS AND DIRECTORIES.

All brands and marks registered, transferred, and cancelled are recorded in their respective registers. At the end of every quarter a statement is published in the *Government Gazette*. Provision is also made for the publication of Horse and Cattle and Sheep Brands Directories. Any Brands Directory or quarterly statement shall in any action or prosecution be received without proof as *prima facie* evidence of the matter contained therein.

MISCELLANEOUS.

Powers of Inspectors and Police.

The Act gives power to any Justice or Inspector or Member of the Police Force to enter upon any run, farm or other premises to inspect any stock, hide or skin, or branding iron or instrument, which may be seized if it is considered that an offence under the Act has been committed. When stock are seized, they may be impounded at the nearest pound, and, if the pound is more than five miles distant, the stock may be held until such time as the offence has been dealt with. Any sheep or cattle having their ears marked contrary to the provisions of the Act may also be seized by an Inspector, and further may be sold or otherwise disposed of as directed by the Minister.

Special Departmental Brands.

Any officer of the Stock and Brands Department may firebrand any cattle on such position as he may think fit with the mark ↑ R for the purpose of indicating that such cattle have been found infected with a contagious disease within the meaning of the Stock Diseases Act. Any officer of the Department of Agriculture may brand any cattle with a brand approved of by the Registrar in any position for the purpose of indicating that such cattle have passed the herd test conducted by the Advisory Committee for the Improvement of Dairying.

Indistinct Sheep Brands and Re-Branding.

When a sheepowner's registered brand has become indistinct he must not re-brand unless he first obtains permission in writing from the Registrar of Brands. Having obtained permission, he must re-brand the sheep on the same position as the brand which has become indistinct. Special notice is drawn to the fact that no provision is made for re-branding sheep owned by a person bearing another person's registered brand.

OFFENCES AND PENALTIES.

Persons branding with unregistered brands; destroying, altering, or defacing brands; disposing of any hide or skin with brands defaced or altered, or having same in his possession; cropping ears of cattle or sheep or illegally earmarking; marking the ear of any stock bearing a registered earmark shall be guilty of an offence under the Act and be liable to a penalty of not less than £2 and not more than £100, or shall be liable to be imprisoned for a term not exceeding six months. For further offences, such as branding otherwise than as prescribed; improperly using numerals on sheep, or earmarks, or tags, unless the owner of a registered brand for sheep; removing or mutilating any ear on any sheepskin (unless it is removed immediately before the skin is subjected to the tanning process); branding with a brand that is not registered in the name of the owner of the stock; introducing into the State any cattle or sheep illegally earmarked; hindering or obstructing an Inspector or other officer in carrying out his duties under the Act, a person shall be guilty of an offence and liable to a penalty of not more than £25 or three months' imprisonment.

In regard to illegally earmarked stock introduced from other States, it will be no offence under the Act if the stock are slaughtered at the Metropolitan Abattoirs within 10 days after their introduction or at any place, as the Minister may direct. The Minister also has power to extend the keeping of illegally earmarked stock in this State for any period.

In regard to earmarks on sheep, any person who is the owner of, or in possession of, any sheep with its ear marked contrary to the provisions of the Act is also liable to a penalty. This includes using unregistered marks on the ears of sheep reserved for registered marks.

Any person who wilfully brands stock of which he is not the rightful owner, or who wilfully uses the brand or mark in the name of any other person shall be guilty of a felony and liable to three years' imprisonment.

LEGAL PROCEDURE.

Except for any indictable offence, such as wilfully branding and not being the rightful owner, any offence under the Act shall be heard in a summary way before a special magistrate or two justices. If the magistrate or the justices are of the opinion that the person charged should be prosecuted for an indictable offence, he or they may commit such person to take his trial for the more serious offence. Magistrates and justices may then make an order as to costs. Proceedings for all offences other than indictable offences may be instituted at any time within 12 months after the commission of such offence. Indictable offences may be instituted at any time.

CONCLUSION.

Special attention of stockowners is drawn to the following. In order to prevent the illegal use of brands or marks the Registrar must be advised immediately of:—

(*a*) The death of owner of a registered brand or mark.
(*b*) Any alteration in the composition of a firm or partnership.
(*c*) Any alteration of run or postal address.
(*d*) Disposal of property for which brand or mark is registered.
(*e*) An owner having no further use for brands or marks.

The necessary action will then be taken regarding transfer or cancellation of any particular brand or mark.

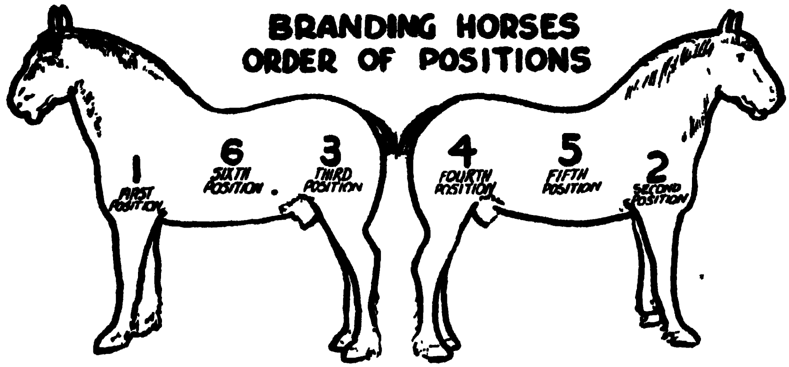
SCALE OF FEES.

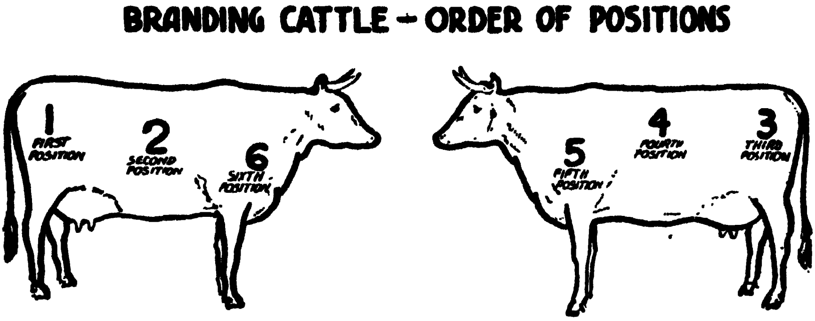
The undermentioned fees shall be paid in respect of the matters set opposite to such matters respectively:—

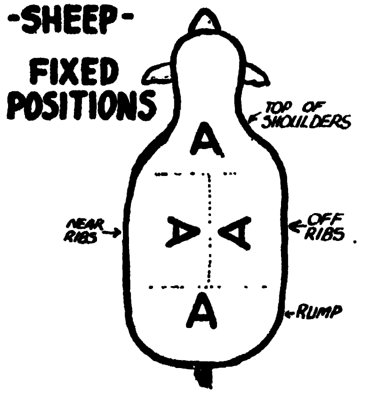
	£	s.	d.
For every registered brand for horses and cattle consisting of a letter or sign and two numerals—			
If applicant does not own more than 100 head	0	10	0
If applicant owns more than 100 head	1	0	0
For every registered brand for horses and cattle, consisting of a sign only	2	0	0
For every registered brand or registered tattoo mark for sheep—			
If applicant does not own more than 1,000 sheep	0	10	0
If applicant owns more than 1,000 sheep	1	0	0
For every distinctive brand or mark for horses or cattle	1	0	0
For any number of distinctive numerals	1	0	0
For every special brand for horses for export	1	0	0
For every registered earmark or firebrand for sheep	0	10	0
For every registered stud stock brand	0	10	0
For every transfer	0	10	0
For every cancellation made on application	0	5	0
For every duplicate copy issued by the Registrar of any certificate of registration	0	2	6

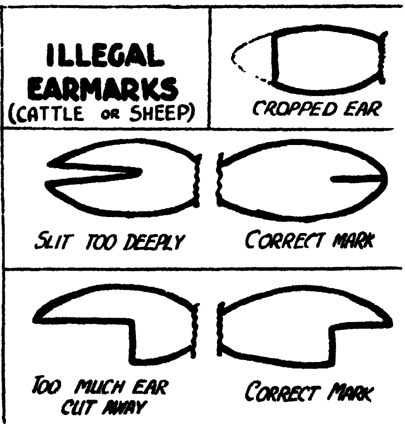
DIAGRAMS OF POSITIONS.

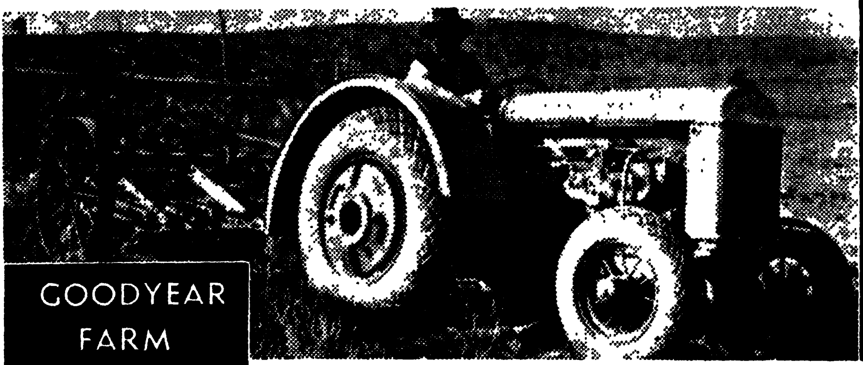
The order of rotation of positions for branding horses and cattle and the fixed position for branding sheep, also the definitions of illegal earmarks are as illustrated below:—











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DAIRYING.

[Chas. E. Verco, Mount Compass.]

[*Paper read at the 46th Congress of the Agricultural Bureau of South Australia.*]

Dairying is a big subject, because of the many branches that come within its successful accomplishment, and many people tackle the job as though all that was necessary was a bucket, a separator, creamcan, and a cow. There is, however, as much science in dairying as any other branch of rural life. In fact, seeing what is required of a high producing herd, and the many failures encountered, it is questionable if dairying does not require more thought and consistent care than other phases of rural activity. There is the suitable property to select; fodders to grow; rotational grazing to consider; water supply; reserve fodders; the right breed and class of cow for the business intended to follow, whether milk, cream, or maybe cheese; selection of herd sires; care of cows before, at, and after calving; the care of milk and cream; and on top of all that, the dairy farmer is supposed to be business man enough to keep abreast of the world, so that he can devise and put into successful working a scheme that will give him marketing results that will bring him a little profit and, if lucky, a living.

SELECTION OF THE PROPERTY.

This is rarely given sufficient thought. Most farmers having property bend their dairying management to what it will do. Possibly this obstacle can never be overcome, at all events in South Australia, because dairying is but a sideline with these folk. But the man who sets out with the idea of dairying should select his property as carefully as would a gardener. There are certain things desirable for dairying that should not be overlooked. There is country in South Australia to carry plenty of dairy farmers, country in good rainfall areas lying idle for the want of enterprising men with a bit of capital to go and develop it. Water is very necessary for dairying, and if there is sufficient for even a little irrigation, so much the better. Failing irrigation, there needs to be some provision made for fodders of a suitable type to carry over the time of the year when the selected district is short of feed, be it autumn, winter, or summer. A property that is able to produce a balanced ration of clover and suitable grasses for a fairly lengthy period of the year, with sufficient high land to allow the cows to camp on, should make a nice dairy farm, provided it has sufficient water to supply the intended herd.

Ensilage, sweet hay, and concentrates should maintain the herd in good milk flow. In almost every district and under varying conditions, there are to be found men who have overcome the natural disadvantages of their surroundings, and provided suitable substitutes for the natural insufficiency of milk producing foods that their districts are short of, at certain periods of the year. The wonder is that others do not follow their example, but frequently the man across the fence is a failure and often a nuisance to the progressive farmer.

SUBDIVISION AND PASTURE MANAGEMENT.

One more point is worthy of consideration, especially in the areas of sufficient rainfall, where the environment is such as to allow of suitable pasture development; the practice of subdividing the property into small paddocks and practising rotational grazing. Some properties lend themselves to this system more than others. The practice is fairly old, but its application is a distinct advantage in both producing and feeding good quality pastures, and carrying more stock on the place.

The fresh, young feed of two or three inches high is very much appreciated by stock, and they respond marvellously, in both milk and meat production. There should be sufficient paddocks available to keep the stock moving every few days, to get the best results. The chief drawback to the system is the cost of fencing. In some parts of the world the stock are tethered and moved at intervals during the day. This, possibly, is a cheaper way, but would take a lot of labour with herds in Australia. However, the principle is there, and one must get as close to it as possible, under his own circumstances.

In the pasture management of a dairy farm one cannot close without reference to the annual topdressing with superphosphate. Our plan is to put on nothing less than a bag to the acre, and on picked spots, more. Feeding pastures must be viewed much the same as feeding stock. Some stock are not worth feeding, some may pay, good ones do pay. A pasture of poor quality grasses may not respond financially to the cost of topdressing, but a dense pasture of valuable clovers and grasses will pay. The pasture will improve in denseness, with the corresponding heavier carrying capacity. The stock grazing on the topdressed pasture will be healthier and more productive.

CHOOSING THE STOCK.

In the selection of cows one must be guided by the business to be followed, whether for cream, milk, or cheese. The qualities of the farm, its proximity to markets, and the inclinations of the farmer must also be considered.

All breeds have their place in the economic functioning of a country, especially one with such a variety of soils, climates, and distances as South Australia. In the heavy rainfall districts, where the soil becomes waterlogged in winter, the lighter class of cattle have a distinct advantage, for the pastures do not get pugged and consequently destroyed so much as they would with the bigger types. In some of the peaty country in the Mount Compass district it is questionable if the heavier cattle could get on the ground safely.

For cream production my selection is unhesitatingly the Jersey cow. She is docile, hardy, and a rich and plentiful creamer. There is not the framework to feed as in the larger breeds. There is no place in the State, to my knowledge, where this fascinating and remunerative little cow has not penetrated and proved herself the ideal and economic cream producer. Even here, a buyer needs care, for the ability to produce and reproduce stock of the same quality rests in the strain and not in the breed. There are good and bad in all breeds, so that whichever breed is chosen, the buyer must still select his strain or he may be a sorrier man after the purchase than before and blame everything and everyone but himself.

There are outward signs that should be studied carefully to help in the selection of a dairy cow, and, when breeding, these should be constantly the aim of a progressive and constructive herdmaster. I am not prepared to say that other cows, without many of these desirable points of conformation will not produce, but they are more the exception than the rule, and very likely will not reproduce these good qualities so consistently in their offspring.

Each breed has its distinctive type, but all dairy cows have certain guiding lines to help in the selection of producers. Beauty must take a certain place in the classification, or the herds will deteriorate in conformation.

A good dairy cow should embody the following points:—Fine flat bone throughout, fine or flat thighs, wide and level between hips, wide in the thurls, wide pins being as level as possible with the hips, a nice level back, with fine and prominent vertebrae ending in a thin tail nicely and squarely hung at the pins. The neck should be thin and long, with a neat attachment to the body. The head should be free from all coarseness or bulliness, clean cut, a fair length and wide between bright prominent eyes. The mouth should be wide, the nostrils prominent, whilst the whole head, typical of the breed, should present an appearance of alertness. The cow should also have a deep barrel, nicely sprung ribs with a good sweep. There should be good lung room, but the shoulders want to be fine and ending in neat but prominent withers. The whole body of the cow should be covered with a nice, loose, mellow skin, on which fine hair exists.

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Production Figures—

*Senior 3-year-old—10,021½lbs. milk; 554.90lbs. butterfat; average test, 5.54.
*Senior 4-year-old—11,193lbs. milk; 644.00lbs. butterfat; average test, 5.75.
5-year-old mature—11,469lbs. milk; 589.25lbs. butterfat; average test, 5.14.
*6-year-old mature—13,134lbs. milk; 723.21lbs. butterfat; average test, 5.51.
*Indicates record figures for the Jersey Breed.

The udder should hang well up behind, with plenty of soft loose folds, and attached to the inside of the legs as high up as possible, then with a pleasing curve to the floor; the udder should run well up forward to give good forequarters, with four nicely-spaced teats hung straight down and of comfortable

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size. This class of udder should not sag with work and become pendulous, but hang nicely and snugly between the hind legs, being high up, wide, and long. Do not select a cow with a pendulous udder or one that is badly quartered, especially sideways.

THE CALVES.

The selection and care of calves is a big subject. Always select calves from the best cows which, for production, should have been tested with the Babcock tester. Let the calf suck the dam for the first two days. This insures it getting the beastings, and the cow's udder is helped to settle down better. Of course, all surplus milk must be taken away. The calf should have whole milk for the next week, and then gradually have this replaced with separator milk until in a month the calf is on separated milk only. If a paddock of green clover is available into which the calves can be turned in the daytime, nothing else need be done to ensure good, healthy heifers. Do not fatten Jersey calves, but keep them growing in good store condition until they are about three to five months in calf. After this it does not hurt to let them get nice and fat for calving. Many more calves, especially stud calves, are spoiled by overfeeding than underfeeding.

FEEDING.

Feed the pregnant cow well, and add salt and bonemeal (or superphosphate) to her ration. Bring her in nice and fat, then let her milk the surplus fat off for a few weeks. Bran is the best medicine and concentrate for the first few days. As soon as the cow shows signs of losing too much condition then gradually accustom her to some concentrates (crushed oats and bran, fifty-fifty). Just aim to keep the cow in good working order, the same as a teamster would his horses.

Short greenfeed is the best milk producer, and if it has plenty of super applied to it the cows will milk better and keep in better health. Rotational grazing is the ideal thing. Move the cows to a fresh paddock every few days. Concentrates should only be used to balance the ration, and not to take the place of greenfeed, hay, or ensilage. The education of a child can only develop the mind the child possesses. No amount of advanced education will materially help the individual who has not the ability to absorb the information. So with the dairy cow—the concentrated feeding can only develop the milking qualifications; if they are not in the strain the feed will be wasted and the system be extravagant. The basis of all milk or butter production is the cow. Be her breed what it may, she must come from a strain of prepotent producers.

In drying off a cow more care should be exercised with the high producer than is sometimes given. There are many methods, but every cow must be taken individually. By improper drying off probably many ills such as mammitis are started. The stale milk should be drawn right out of the udder when the cow is milked, and not the udder just eased up a bit. Bag up the udder, and let it have some pressure to stop the flow of milk, but when milked out strip it properly and get all the stale milk out; do not leave a lot of old milk there to be absorbed as best it can or go bad in the vessel.

A dry cow should be fed well and brought in fat. This may help to foster milk fever in high producers, but it gives the cow a good start for the fresh lactation.

THE HEAD OF THE HERD.

The selection of the bull is one of the most important things for a dairy farmer to give his attention to. Too much care and thought cannot be given to this part of the constructive dairy herd. Every calf dropped carries 50 per cent. of the sire's blood and 25 per cent. of the sire's dam. The same outline that is looked for in the dairy cow should be a guide in a general way for the selection of a bull. Bear in mind that the bull must be masculine in appearance and not feminine. A cow's neck and head on a bull would be out of place, and be just as objectionable as a bull's head and neck on a cow.

Probably the best guide is to study the dam of the bull and, if possible, the dam of his sire. From these two cows will probably come most of the qualities produced in the bull's stock, so far as his 50 per cent. of the calf is concerned. The dam of the bull should certainly be a good type of cow of pure breeding, with a good udder and production. The greatest difficulty in selecting a bull comes when the cows attain to a high standard, be they of a pure breed or even a grade breed. Then one must study type and production, and also be sure to get a sire that will improve the stock and not give offspring of an inferior type or lesser production.

Seeing that it is so difficult to make a decent living out of dairying under present conditions, it will pay every dairyman to breed and keep better cows and feed them better, so that the same profit can be made from the fewer cows and thus leave the extra land that was used by the cows disposed of, for fattening lambs or increasing the income through another avenue.

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DEPARTMENT OF AGRICULTURE.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

LEADING SCORES TO WEEK ENDED 29th SEPTEMBER, 1935.—FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—White Leghorns.

	Eggs Laid.	Bird Nos.
Singles—		
F. J. Buck	124	219
E. McKee	124	27
H. C. Stacy	122	36
Trios—		
E. McKee	346	28–30
E. McKee	320	25–27
W. H. A. Hodgson	311	298–300
Teams—		
E. McKee	666	25–30
W. Sickert	591	169–174
C. R. Wharton	578	127–132

Class No. 2.—Any other Light Breed.

Singles—		
A. Heaysman (Cuckoo Leghorn)	113	323
Langmaid and Bettison (Black Minorca)	90	321

Class No. 3.—Black Orpingtons.

Singles—		
A. G. Dawes	110	327
K. Pennack	107	340
K. Pennack	102	337
Trios—		
H. J. Mills	256	331–333
K. Pennack	221	337–339
A. P. Urlwyn	219	465–467
Teams—		
K. Pennack	439	337–342
H. J. Mills	424	331–336
H. H. Gallagher	382	343–348

Class No. 4.—Any other Heavy Breed.

Singles—		
H. J. Mills (Rhode Island Red)	135	364
V. F. Gameau (Rhode Island Red)	109	381
V. F. Gameau (Rhode Island Red)	108	380
Trios—		
K. Pennack (Barnevelder)	284	388–390
V. F. Gameau (Rhode Island Red)	257	379–381
H. J. Mills (Rhode Island Reds) (2 birds only competing)	227	364–366
Teams—		
K. Pennack (Barnevelder)	476	385–390
V. F. Gameau (Rhode Island Reds)	439	379–384
A. G. Dawes (Rhode Island Reds)	374	367–372

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Singles—		
G. R. Cowell	100	391
A. J. Monkhouse	91	402
G. R. Cowell	89	396
Trios—		
A. J. Monkhouse	217	400–402
A. J. Monkhouse	204	397–399
Teams—		
A. J. Monkhouse	421	397–402
G. R. Cowell	373	403–408

Class No. 7.—Black Orpingtons.

Singles—		
W. R. Christie	88	409

Class No. 8.—Any other Heavy Breed.

W. R. Christie	78	412

SECTION 3.—WET MASH.

Singles—		
Eric Pratt, Abattoirs (White Leghorn)	114	434
Herbert Oliver, McLaren Vale, Black Orpington)	113	442
Peter Western, Ascot Park (White Leghorn	113	415
Lyol Stone, Morphett Vale (Black Orpington)	112	443
Malcolm Booth, Bridgewater (Black Orpington)	111	445

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April to 30th June.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 31st July, 1935.	No. Eggs Laid Month of August, 1935.	Total Eggs Laid 1st April, 1935, to 31st August, 1935.
No. 1 Test	1,728	845	2,573
No. 2 Test	1,776	839	2,615
No. 3 Test	1,812	922	2,734
No. 4 Test	1,464	811	2,275
No. 5 Test	1,465	795	2,260

	No. Eggs Laid 1st April, 1935, to 31st August, 1935.	No. Eggs Laid Month of September, 1935.	Total Eggs Laid 1st April, 1935, to 30th September, 1935.
No. 1 Test	2,573	934	3,507
No. 2 Test	2,615	938	3,553
No. 3 Test	2,734	928	3,662
No. 4 Test	2,275	849	3,124
No. 5 Test	2,260	819	3,079

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—*White Leghorns.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.	
B. Cooke, Kanmantoo.	1	81	
	2	69	
	3	84	234
	4	90	
	5	106	
	6	105	301
			535
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	102	
	14	—	
	15	119	221
	16	110	
	17	84	
	18	68	262
			483
H. F. Muirson, Yundi.	19	5	
	20	73	
	21	59	137
	22	66	
	23	104	
	24	58	228
			365
E. McKee, 5, Rose Street, Carrondown.	25	79	
	26	117	
	27	124	320
	28	118	
	29	121	
	30	107	346
			666
H. C. Stacy, Meadows.	31	62	
	32	78	
	33	120	260
	34	47	
	35	93	
	36	122	262
			522
T. Cleaver, Bridgewater.	37	40	
	38	60	
	39	75	175
	40	100	
	41	55	
	42	73	228
			403
C. Sandstrom, Yundi.	43	81	
	44	—	
	45	dead	81
	46	58	
	47	55	
	48	107	220
			301

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.	
A. J. Monkhouse, Woodside.	49	56	
	50	113	
	51	93	262
	52	112	
	53	58	
	54	82	252
			514
J. F. Smith, Meadows.	55	78	
	56	84	
	57	7	169
	58	56	
	59	4	
	60	101	161
			330
A. Young, Bridgewater.	61	102	
	62	89	
	63	85	276
	64	53	
	65	108	
	66	82	243
			519
R. W. McAlister, Yundi.	67	53	
	68	77	
	69	95	225
	70	57	
	71	43	
	72	82	182
			407
T. Duhring, Mallala.	73	109	
	74	78	
	75	64	251
	76	50	
	77	64	
	78	74	188
			439
R. J. Underdown, Meadows.	79	41	
	80	53	
	81	108	202
	82	74	
	83	70	
	84	100	244
			446
S. Hill, Bridgewater.	85	62	
	86	102	
	87	92	256
	88	98	
	89	105	
	90	83	286
			542
W. R. Hedger, Yundi.	91	58	
	92	66	
	93	71	190
	94	75	
	95	50	
	96	73	198
			388

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.	
Langmaid & Bettison, Salisbury.	97	53	
	98	50	
	99	54	157
	100	92	
	101	45	
	102	—	137
			294
E. Portlock, Meadows.	103	114	
	104	88	
	105	93	295
	106	77	
	107	63	
	108	95	235
			530
Murray Powell, Jupiter Creek.	109	110	
	110	30	
	111	93	233
	112	67	
	113	119	
	114	36	222
			455
G. W. Bignell, Meadows.	115	97	
	116	69	
	117	69	235
	118	67	
	119	98	
	120	100	265
			500
W. M. Field, Yundi.	121	82	
	122	26	
	123	67	175
	124	44	
	125	65	
	126	98	207
			382
C. R. Wharton, Meadows.	127	86	
	128	96	
	129	105	287
	130	108	
	131	91	
	132	92	291
			578
H. H. Hefford, Murray Bridge.	133	74	
	134	105	
	135	87	266
	136	41	
	137	110	
	138	67	218
			484
F. W. Gage, Meadows.	139	75	
	140	4	
	141	dead	79
	142	93	
	143	62	
	144	60	215
			294
W. H. L. Norman, Echunga.	145	77	
	146	57	
	147	—	134
	148	111	
	149	74	
	150	47	232
			366
B. R. Whittington, Yundi.	151	97	
	152	46	
	153	70	213
	154	95	
	155	89	
	156	63	247
			460
B. C. Sanders, Meadows.	157	95	
	158	105	
	159	107	307
	160	92	
	161	31	
	162	dead	123
			430
H. H. Gallagher, Pooraka.	163	32	
	164	78	
	165	83	193
	166	59	
	167	40	
	168	93	192
			385
W. Sickert, Meadows.	169	114	
	170	72	
	171	107	293
	172	80	
	173	104	
	174	114	298
			591
W. Restall, Echunga.	175	40	
	176	—	
	177	63	103
	178	92	
	179	78	
	180	92	262
			365
A. G. Dawes, 230, Portrush Road, Glenunga.	181	100	
	182	75	
	183	69	244
	184	49	
	185	60	
	186	102	211
			455
G. W. Sykes, Yundi.	187	92	
	188	52	
	189	47	191
	190	63	
	191	61	
	192	97	221
			412
R. Bartley, Meadows.	193	70	
	194	111	
	195	87	268
	196	62	
	197	83	
	198	97	242
			510
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	61	
	200	72	
	201	63	196
	202	88	
	203	58	
	204	64	210
			406

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.	
J. J. Devlin, Meadows.	205	94	
	206	85	
	207	117	296
	208	88	
	209	63	
	210	114	265
			561
D. J. Foxwell, Echunga.	211	96	
	212	65	
	213	31	192
	214	14	
	215	81	
	216	26	121
			313
F. J. Buck, Meadows.	217	86	
	218	92	
	219	124	302
	220	76	
	221	79	
	222	71	226
			528
J. A. Grist, Yundi.	223	18	
	224	33	
	225	64	115
	226	25	
	227	—	
	228	73	98
			213
L. A. King, Meadows.	229	103	
	230	93	
	231	dead	196
	232	4	
	233	72	
	234	19	95
			291
R. W. Sando, Echunga.	235	80	
	236	60	
	237	64	204
	238	78	
	239	69	
	240	59	206
			410
E. W. Young, Meadows.	241	103	
	242	87	
	243	80	270
	244	85	
	245	—	
	246	40	125
			395
A. Jarvis, Yundi.	247	91	
	248	51	
	249	59	201
	250	87	
	251	65	
	252	115	267
			468
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12
S. Bridge, Yundi.	259	84	
	260	100	
	261	82	266
	262	44	
	263	87	
	264	70	201
			467
H. G. Egarr, Meadows.	265	83	
	266	79	
	267	25	187
	268	18	
	269	90	
	270	40	148
			335
R. H. Smith, Yundi.	271	93	
	272	57	
	273	86	236
	274	107	
	275	39	
	276	89	235
			471
J. M. Lawson, Meadows.	277	98	
	278	98	
	279	74	270
	280	59	
	281	96	
	282	58	213
			483
J. O. Marshall, Yundi.	283	12	
	284	81	
	285	88	181
	286	102	
	287	93	
	288	62	257
			438
G. Joyce, Meadows.	289	13	
	290	121	
	291	60	194
	292	78	
	293	102	
	294	73	253
			447
J. A. Bradtke, Yongala.	295	11	
	296	—	
	297	78	
		89	
W. H. A. Hodgson, Salisbury.	298	114	
	299	96	
	300	101	
		311	
A. W. McDonald, Gawler.	301	47	
	302	76	
	303	83	
		206	
J. H. Dowling, Glossop.	304	70	
	305	105	
	306	21	
		196	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept,. 1935.	
A. P. Urlwin, Balaklava.	307	80	
	308	64	
	309	9	
		153	
L. S. Ekers, Mount Compass.	310	88	
	311	20	
	312	101	
		209	
V. E. Williams, Semaphore Park.	313	96	
	314	99	
	315	99	
		294	
F. P. Munzberg, Tanunda.	316	98	
	317	86	
	318	99	
		283	
Total Class 1		22,330	

Class 2—Any Other Light Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept,. 1935.	
Langmaid & Bettison, Salisbury. (Black Minorcas.)	319	70	
	320	58	
	321	90	
		218	
A. Heaysman, Government Road, Eden Hills. (Cuckoo Leghorns.)	322	77	
	323	113	
	324	42	
		232	
Total Class No. 2		450	

Class No. 3—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept,. 1935.	
A. G. Dawes, 230, Portrush Road, Glenunga.	325	43	
	326	22	
	327	110	175
	328	55	
	329	65	
	330	74	194
			369
H. J. Mills, 108, Edward Street, Edwardstown.	331	99	
	332	82	
	333	75	256
	334	71	
	335	97	
	336	dead	168
			424
K. Pennack, Pooraka.	337	102	
	338	84	
	339	35	221
	340	107	
	341	52	
	342	59	218
			439
H. H. Gallagher, Pooraka.	343	83	
	344	57	
	345	68	208
	346	86	
	347	64	
	348	24	174
			382
B. Cooke, Kanmantoo.	349	20	
	350	32	
	351	25	
		77	
H. H. Hefford, Murray Bridge.	352	88	
	353	51	
	354	43	
		182	
J. H. Dowling, Glossop.	355	56	
	356	27	
	357	87	
		170	
L. S. Ekers, Mount Compass.	358	69	
	359	49	
	360	86	
		204	
A. G. Dawes, 230, Portrush Road, Glenunga.	452	41	
	453	69	
	454	67	177
	455	5	
	456	86	
	457	77	168
			345
A. P. Urlwin, Balaklava.	465	62	
	466	85	
	467	72	
		219	
Total Class No. 3		2,811	

Class No. 4—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept,. 1935.	
H. J. Mills, 108, Edward Street, Edwardstown. (Rhode Island Reds.)	361	1	
	362	dead	
	363	52	53
	364	135	
	365	92	
	366	dead	227
			280
A. G. Dawes 230, Portrush Road, Glenunga. (Rhode Island Reds.)	367	54	
	368	70	
	369	49	173
	370	81	
	371	58	
	372	62	201
			374
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens. (Rhode Island Reds.)	373	80	
	374	98	
	375	dead	178
	376	16	
	377	67	
	378	66	149
			327
V. F. Gameau, Findon Road, Woodville. (Rhode Island Reds.)	379	40	
	380	108	
	381	109	257
	382	87	
	383	19	
	384	76	182
			439

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.	
	385	74	
	386	66	
K. Peanack, Pooraka. (Barnevelders.)	387	52	192
	388	96	
	389	84	
	390	104	284
			476
	458	10	
	459	70	
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	460	91	171
	461	15	
	462	70	
	463	75	160
			331
Total Class No. 4			1,947

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.	
	391	100	
	392	41	
G. R. Cowell, Balhannah.	393	26	167
	394	50	
	395	33	
	396	89	172
			339
	397	38	
	398	86	
A. J. Monkhouse, Woodside.	399	80	204
	400	54	
	401	72	
	402	91	217
			421
	403	83	
	404	75	
G. R. Cowell, Balhannah.	405	40	198
	406	69	
	407	52	
	408	54	175
			373
Total Class No. 5			1,133

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.
	409	88
W. R. Christie, Upper Mitcham.	410	54
	411	71
		213
Total Class No. 7		213

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	78
	413	33
	414	71
		182
Total Class No. 8		182

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.
Peter Western, Ascot Park School. (White Leghorn.)	415	113
Peter Western, Ascot Park School. (White Leghorn.)	416	108
William Sando, Echunga School. (White Leghorn.)	417	85
Douglas Marshall, Yundi School. (White Leghorn.)	418	89
Norman Page, Murray Bridge School. (White Leghorn.)	419	84
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	80
Dean Colwell, Grange School (White Leghorn.)	421	71
Warren Hannaford, Paracombe School (White Leghorn.)	422	108
W. Horne, Woodville School. (White Leghorn.)	423	dead
Owen Robinson, Ascot Park School. (White Leghorn.)	424	107
June Chapman, Woodchester School. (White Leghorn.)	425	64
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	73
Jack O'Sullivan, Morphett Vale School. (White Leghorn.)	427	95
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	51
James Taylor, Morphett Vale School. (White Leghorn.)	429	84
William Gregory, Victor Harbour School. (White Leghorn)	430	66
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	60
Clifford Burford, Smithfield School. (White Leghorn.)	432	44
Tom Callaghan, Smithfield School. (White Leghorn.)	433	13
Eric Pratt, Abattoirs School. (White Leghorn.)	434	114
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	97
Alan Yelland, Cunliffe School. (Minorca.)	436	63
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	88

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 29th Sept., 1935.
Clarence King, Tarlee School. (White Leghorn.)	438	41
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	100
Donald Heading, Sturt School. (Black Orpington.)	440	100
Clive Steer, Sturt School. (Black Orpington.)	441	88
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	113
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	112
Ray Candy, Noarlunga School. (Black Orpington.)	444	49
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	111
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	87
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	23
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	63
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	109
John Keidoulis, Orroroo School. (Black Orpington.)	450	87
Bruce Dooland, Thebarton School. (Black Orpington.)	451	56
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	41
Total		2,932

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ADELAIDE.

AGRICULTURE IN THE TEMPERATE AND SUB-TROPICAL CLIMATES OF THE SOUTH.

[*A Report by the Deputy Director of Agriculture (W. J. Spafford) to His Excellency Sir Winston Dugan, K.C.M.G., C.B., D.S.O., Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia. Mr. Spafford took a brief tour* of portions of the principal agricultural countries in the same climatic zones as the settled portions of Australia, in fulfilment of the appointment as Honorary Commissioner, conferred upon him by His Excellency, to inquire into and report upon the Production and Preparation for Marketing of Agricultural Products, including Crops and Livestock in South America, South Africa, and New Zealand.*]

(Continued from page 233.)

ARGENTINA.

Argentina is one of the most important agricultural countries of the world, and is located in the same climatic zone as is Australia, but it has a very great advantage over the latter country in that it is so much closer to the principal markets for primary rural products that Europe can be reached in just half the time.

THE COUNTRY OF ARGENTINA.

Argentina is a very large agricultural country, lacking coal and iron, and contains about 690,000,000 acres of land, and if Uruguay and the Province of Rio Grande do Sul of Brazil had belonged to the country it would have been almost triangular in shape, with the Andes mountains running nearly directly north and south as the western side of the triangle. As it is, the top end of Argentina for a distance of about 1,000 miles is roughly rectangular, the width near the north being about 970 miles, and at a line running east and west just below La Plata, nearly 800 miles. Near this line the coastline turns almost due west for about 270 miles, leaving the width of the country something approaching 500 miles, and with a very irregular coastline is more or less gradually narrowed until it becomes about 140 miles in width at the southern boundary of the Territory of Santa Cruz.

Besides this area, which is bounded by Chile on the west and south, Bolivia on the north, Paraguay, Southern Brazil, and Uruguay on the north-east and the Atlantic Ocean on the east, Argentina also possesses about half of the Island of Tierra del Fuego, which she shares with Chile, and which is separated from the mainland by the Straits of Magellan.

The rivers in the northern portions of Argentina are very important even now, but some day will be even more so, both from an irrigation and a navigation point of view. The River Plate, which is so well known because Buenos Aires, the capital of Argentina, is built on one of its banks, is hardly a river in the true sense of the word, but is rather an estuary formed by the Rivers Paraná and Uruguay, and is only about 100 miles in length, and varies between 23 and 56 miles in width. The Paraná is one of the big rivers of the world, and besides the last 700 miles or so of its course being in Argentina, another 400 miles or so forms the northern boundary of the Province of Corrientes, and the Territory of Misiones, and it then continues in a north-easterly direction into Brazil to its source, some hundreds of miles away. This river is navigable for steamers throughout the

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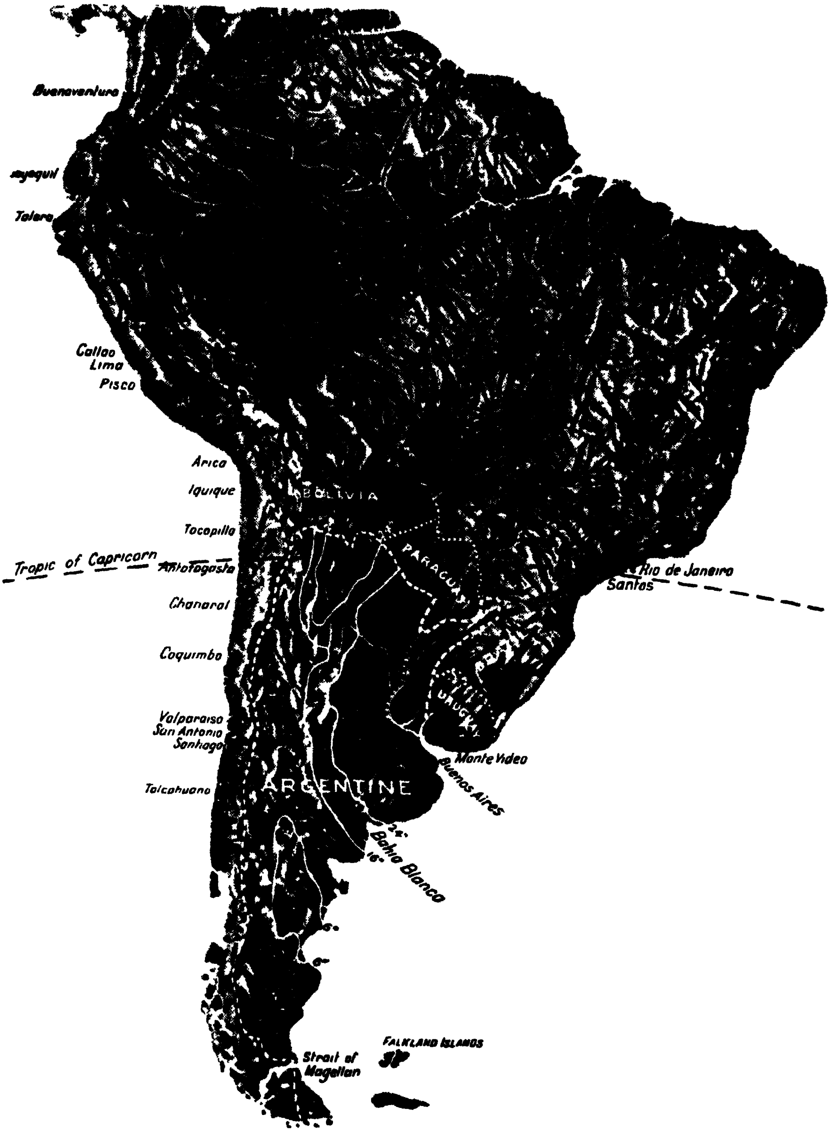
* Tour made in the company of Col. C. P. Butler ("Yattalunga," of the *Advertiser* and the *Chronicle.*)



[Enlargement by Government Photolithographer.

A Raised Map of South America, showing Mountains, Valleys, and Principal Rivers. Within the Boundaries of Argentina are shown the 24-inch, 16-inch, and 6-inch rainfall isohyets. Nearly all of the Great Plain of Argentina is located between the 24-inch rainfall isohyet and the Parana River.

portion in Argentina, and as it is located on the edge of an enormous fertile plain, and is always of muddy appearance, because of the silt it carries, must be important for irrigation purposes some day. The full length of the Paraná is stated to be 2,800 miles. The Uruguay River, which is usually taken to be 940 miles in length, is a wide stream as well, and forms the boundary between Argentina and Uruguay, and continues on into Brazil in a north-easterly direction to its source in the mountains. The Uruguay is navigable for steamers for hundreds of miles above its junction with the Paraná.

There are no rivers of importance in the extensive plains in the centre of Argentina, but to the south there are about a dozen or so very useful streams which reach the Atlantic Ocean from the Andes, some of the largest being the Colorado, Negro, Chubut, Chico, and Santa Cruz. Besides the important rivers there are countless streams with their sources in the Andes which flow into Argentina, but with insufficient volume to make separate tracks to the Atlantic. Some few of these small streams have been harnessed for irrigation purposes, and it appears certain that this form of agriculture can be extended enormously.

Although Argentina has very great areas of plain lands, quite an appreciable proportion of the country is mountainous, and other areas are hilly. The mighty Andes extend north and south for the whole length of the country, and as the highest peak of this range in Argentina reaches to 23,380 feet (Aconcagua), and several others are above 16,000 feet, it is inevitable that a considerable extent of country along the western side of the Republic is mountainous, and so almost useless for agriculture. On the other hand, the presence of this very high range affects the climate, and in this case has a most beneficial effect on the rainfall and its distribution in so far as Argentina is concerned. Further, so many of the peaks are permanently snow-capped that an unfailing periodic supply of water for irrigation flows from these mountains down to the level lands below.

There is a distinct mass of hills near Córdoba, which covers a relatively small area between the big plain and the Andes; the Territory of Misiones is all mountainous, and comprises the southerly end of a Brazilian range; whilst practically all of the country south of the Province of Buenos Aires is decidedly hilly.

THE IMMENSE AGRICULTURAL PLAIN OF ARGENTINA.

The tremendous extent of plain country in Argentina makes a strong impression on all visiting agriculturists, and the immensity of the principal plain is staggering, and must be seen to be realised. It is easy to say that commencing near the southern end of the Province of Buenos Aires, an apparently level plain continues almost due north to the boundary of the country, which is distant about 1,200 miles, and for most of its length is about 400 miles wide, with one place near the middle where it is constricted for a short distance to about 200 miles in width. Bounded on the east by the Atlantic Ocean for part way, and then by the Paraná River, and on the west by hills, the plain includes all of the Provinces of Buenos Aires and Santa Fé and the Territories of the Chaco and Formosa, about half of the Province of Salta, most of the Provinces of Santiago del Estero and Córdoba, and some of the Province of San Luis and of the Territory of La Pampa. The only breaks of consequence in this great plain are two low ranges of hills jutting into it in the Province of Buenos Aires, one near Bahia Blanca and the other starting at the coast near Mar del Plata.

Although these figures might give some sort of an idea of the size of the plain, its vast extent can only be realised by travelling over it in different directions for days at a time, when it appears somewhat like being at sea in calm weather, with the unbroken horizon in all directions. The only relief to the eye is given by trees—mainly Eucalypts—planted around homesteads, and as in many cases the estancias are large, and so homesteads far apart, these breaks are sometimes truly infrequent. There are only few rivers and creeks in the plain, so bridges and culverts are not plentiful, and naturally, because of the lack of hills, trees, and watercourses, the country is monotonous to anyone not keenly interested in agriculture. To an agriculturist, however, it is extremely attractive, because it is such highly productive country that the growth of plants is most prolific, whether they be crops, pastures, trees, or weeds. The statement is sometimes made that a man could start with a plough from Buenos Aires and strike a furrow for a distance of 600 miles without being hindered by a stone or a tree, and this is almost literally correct, for the plain is stoneless and on much of it the largest plant growing naturally is the Pampas Grass.

This immense plain is probably the greatest and most important strip of agricultural country in the world, at all events in temperate and mild sub-tropical climates, for not only does it present no physical difficulties to agricultural operations, but it has all that is desired for the promotion of prolific growth of plants. The soils are deep, chocolate-coloured silts of such free-working texture that the implements shine when pulled through them, and at the same time have good natural drainage and high moisture-holding powers. The rainfall received over most of the plain is at least 24 inches per annum on the average, and up to 48 inches, and is so well distributed that just about 30 per cent. of the rain falls in each of the seasons of spring, summer, and autumn, with only about 10 per cent. in winter. Temperatures are fairly high in summer, and rarely low in the winter, so favouring long-period growth. Good underground water is plentiful at relatively shallow depths.

Very heavy production of beef, wheat, maize, and linseed, as well as smaller quantities of most other agricultural products, now come from this strip of country, although so much of it is occupied as large holdings, and its potentialities are simply amazing, even without using any of the water flowing into it and on its outskirts for irrigation purposes.

CLIMATE OF ARGENTINA.

There are few other countries in the world occupied by the one people and controlled by the one Government which are so favourably situated as is Argentina, in so far as climate is concerned. The most northerly point of the Province of Jujuy is about 130 miles into the tropics above the Tropic of Capricorn, whilst the southern extremity is in Antarctic conditions, at something just below latitude 55deg. S. At the same time, the country has the benefit of about 1,600 miles of coastline in the Atlantic, and of the very high mountain range—the Andes—extending the whole length of the country.

Nearly two-thirds of the country receives more than 20 inches of average annual rainfall, about one-sixth receives between 20 inches and 8 inches, and the remainder, a long narrow strip which runs down from the top of the country along the foothills of the Andes to a point somewhere near the Colorado River, then broadens out towards the Atlantic coast, extending from near the mouth of the Rio Negro to the most southerly point of the mainland of Argentina, gets less than 8 inches of rain per annum, on the average.

Not only is an enormous area of this country well provided with rain, but its distribution in most localities is almost ideal, as can be seen by a glance at the following table, setting out the average annual rainfall over a period of 15 years, for at least one recording station in each Province or Territory of the Republic where records are taken, and in this table can also be seen the incidence of the rainfall in the four seasons of the year.

Argentina.—Distribution of the Rainfall (15-year Average).

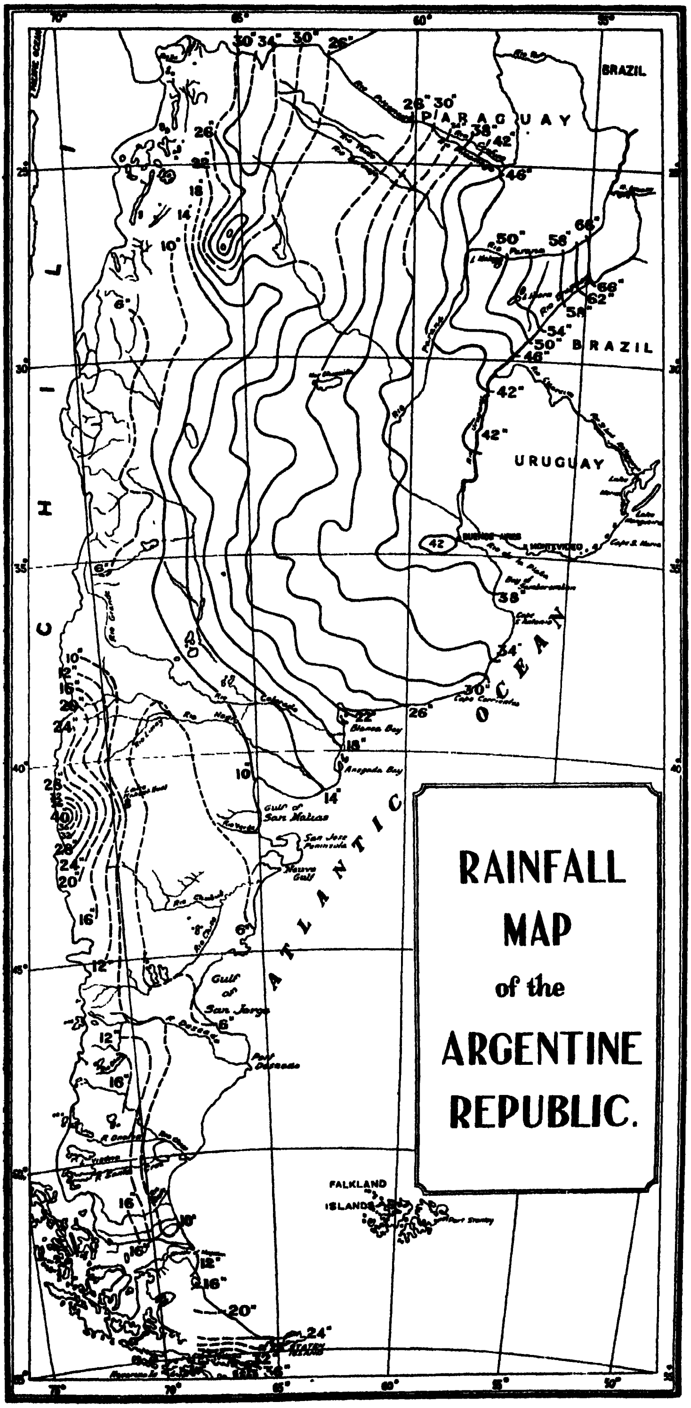
Recording Station.		Classification According to Rainfall.	Average Annual Rainfall.	Percentage Distribution Each Season.			
Province or Territory.	Recording Station.			Winter, June to Aug.	Spring, Sept. to Nov.	Summer Dec. to Feb.	Autumn Mar. to May.
		Ins.	Ins.	%	%	%	%
T. of Misiones	Posadas.....	Above 40	58·77	18·4	26·9	25·3	29·4
P. of Corrientes ...	Corrientes ..		49·45	10·3	25·5	29·2	35·0
T. of Formosa	Formosa ...	"	48·33	10·8	26·8	30·6	31·8
P. of Entre Rios ..	Villaguay ...	"	40·74	14·7	27·2	25·7	32·4
Federal Capital ...	Buenos Aires	Between 25 and 40	39·89	17·5	26·2	26·8	29·5
T. of the Chaco....	La Sabana ..		39·38	6·9	26·6	33·6	32·9
P. of Buenos Aires	Carlos Tijedor		38·03	11·3	26·1	33·7	28·9
P. of Tucuman ...	Tucuman ...	"	37·52	4·1	17·8	52·5	25·6
P. of Santa Fé	Santa Fé ...	"	36·46	11·4	22·7	34·3	31·6
P. of Buenos Aires	Olavarria ...	"	32·13	14·3	26·7	29·1	29·9
P. of Salta	Salta	"	30·80	1·4	12·4	65·6	20·6
P. of Jujuy	Jujuy	"	29·81	1·6	13·1	60·9	24·4
P. of Córdoba	Córdoba	"	28·61	5·3	22·5	46·9	25·3
T. of La Pampa ...	Santa Rosa..	"	26·57	9·8	33·2	34·6	22·4
P. of San Luis.....	San Luis ...	"	25·96	5·8	20·8	51·1	22·3
P. of Santiago del Estero	Santiago del Estero	Between 16 and 25	21·54	4·7	18·6	53·6	23·1
P. of La Rioja	La Rioja ...	Between 12 and 16	14·02	3·3	16·0	59·6	21·1
P. of Catamarca ..	Catamarca ..		13·58	4·7	16·8	58·3	20·2
T. of Rio Negro ...	Conesa......	Below 12	9·40	14·3	32·5	28·8	24·4
P. of Mendoza.....	Mendoza ...		8·04	9·0	23·8	44·1	23·1
T. of Néuquen	Néuquen ...	"	5·56	29·1	29·2	16·3	25·4
T. of Chubut	Colonia Sarmiento	"	5·52	36·4	19·5	13·9	30·2
P. of San Juan ...	San Juan ...	"	3·35	7·2	8·8	65·8	18·2
G. of Misiones	Colonia Findlandesa	Highest average	67·16	21·0	26·7	22·5	29·8
P. of San Juan ...	Pocito	Lowest average	2·52	11·3	19·4	49·6	19·7

As can be seen from the above figures, the distribution of the rainfall of all places receiving more than 25 inches of average annual rainfall, except Tucuman, Salta, and Jujuy—all of which are near the tropics—is almost ideal for promoting luxuriant growth, because for the three seasons, spring, summer, and autumn, the falls are about equal, and during the cool weather of winter, when less is needed, the falls are lighter.

The only part of the country where the proportion of winter rainfall is high is in the southern districts, but there the total yearly falls are so low that it is not very important. The total area receiving less than 12 inches of average annual rainfall is quite considerable, probably 100,000,000 acres or so, but this is not at all serious in a country like Argentina, because ample irrigation water is available, when controlled, to convert quite a lot of this poor agricultural country into gardens and high-producing farms at some time in the future.

TEMPERATURES IN ARGENTINA.

From an agricultural point of view the temperatures recorded in those parts of Argentina utilised for crops and livestock are very favourable indeed. In the northern provinces the temperature sometimes goes a good deal above 100° Fahr. in the shade in the summer, but away from the mountains really low temperatures are never experienced in the winter. In the central districts, where there is so



Rainfall Map of the Argentine Republic. The rainfall isohyet for every 4 inches of average annual rainfall is shown, commencing from the 6-inch rainfall isohyet.

much good land, and well-distributed fairly heavy rainfall, the summer temperature sometimes passes 100° Fahr. in the shade, but as a rule the heat is not nearly so great, and as the humidity of the atmosphere is fairly high, the losses of moisture from soils and plants are not excessive, nevertheless the humidity of this zone is not such as to be unbearable, nor even very unpleasant for human beings. In the winter the temperature may fall a few degrees below freezing point for some distance north of Buenos Aires up the plain country, but this is only likely for a short period of time, and the atmosphere warms up on the approach of spring. The low-rainfall districts of the south get some hot weather in the summer, but on the whole are relatively cool, whilst in the winter, although the exposed parts are bleak and cold, the climate is quite mild enough for the healthy development of sheep. In the Andes a hot day is occasionally experienced, but for the most of the year it is extremely cold and only mild during the summer months.

THE ECONOMIC UTILISATION OF THE LAND.

The official estimate of how suitable the land of Argentina is for agricultural purposes and how it is being used at present is somewhat as follows:—

Suitability of all Lands in Argentina.

Land.	Area.	Percentage.
	Acres.	Per Cent.
Adapted for cereals	197,892,000	28.68
Adapted for crops and livestock	269,583,000	39.07
Occupied by forests and woods	123,648,000	17.92
Unsuitable for livestock	98,877,000	14.33
Total land in Argentina	690,000,000	100.00

Utilisation of Argentina's Lands.

How Used.	Area.	Percentage.
	Acres.	Per Cent.
Under cultivation	74,175,000	10.75
Grazed by livestock	306,636,000	44.44
Forests and woods	123,648,000	17.92
Desert, towns, mountains, lakes, and rivers ..	185,541,000	26.89
Total land in Argentina	690,000,000	100.00

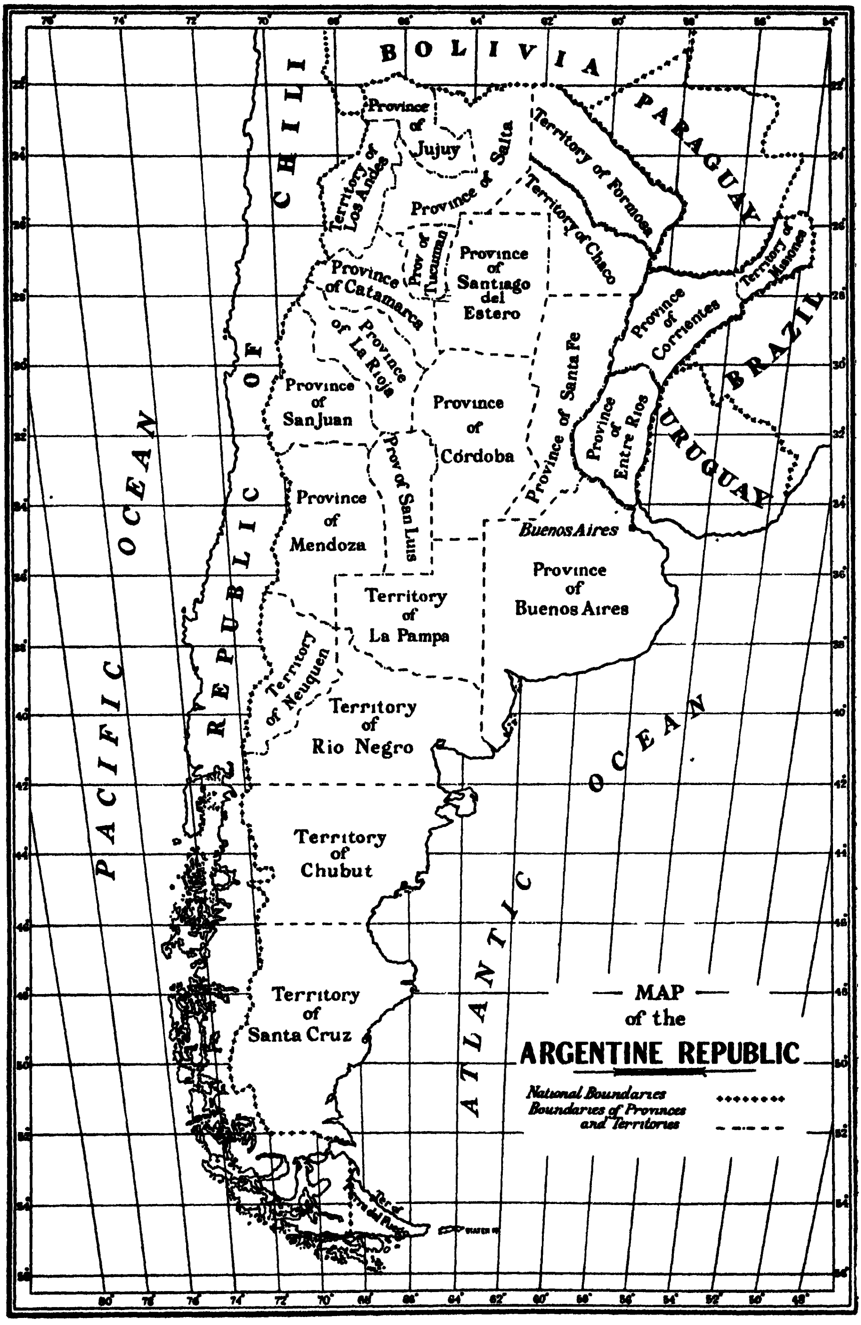
SOILS OF THE AGRICULTURAL DISTRICTS OF ARGENTINA.

One of the main reasons why the potentialities of Argentina are so great is because of the high fertility of most of the soils to be found in her very extensive agricultural districts. The great bulk of those on the Great Plain appear to be sedimentary soils formed from disintegrated rocks of the Andes or of the Brazilian mountains. On the plains the soils are silty loams and sufficiently coarse in texture to admit all steady rains to soak into them and to lead to the polishing of the parts of implements which are dragged through them. The colour of the soils is that dark-chocolate which generally denotes very high fertility, and in most places the dark-coloured soil extends from one foot to two feet or more in depth before there is a change of colour. Although there are no stones on the plain the subsoils are sufficiently porous to permit of the full growth of lucerne and to absorb the rain so that few creeks and no large rivers occur on the plain despite the high average rainfall. Also of great importance is the fact that the soils are very regular in nature, it being possible to go for miles and miles without being able to distinguish any great differences of colour or texture, and as a consequence crops of all kinds grow to a regular height, and patchiness of growth is not usual. The undulating country on the edge of the Great Plain to the north of Buenos Aires possesses soils of slightly heavier texture and darker colour than out on the plain, but they are still fairly free-working loams and have very high fertility. On the side of the Great Plain closest to the Andes, where the rainfall is so low that irrigation is necessary, the soils contain much more lime and are of a loose open nature, in many cases resting on gravels, and so are admirably suited to irrigation because their natural drainage is so good. This applies equally to the strips of country contiguous to the rivers flowing from the Andes to the sea in the country south of Buenos Aires. In and near the low-rainfall zone the soils are well supplied with lime and in many cases are essentially calcareous soils. All of them are fairly loose and open loams, as is usual with this class of country.

THE AGRICULTURE OF ARGENTINA.

The agricultural production of Argentina, with a population of about 12,000,000 people only, is very high indeed, but the very wonderful natural conditions which exist account for the quantity of primary rural products raised, still it is rather surprising that a country with such a long history, and such outstandingly good natural conditions, has such a relatively small population. On the other hand, some hundreds of years of fighting were not conducive to agricultural progress, nor the building up of a big population, but a wave of rapid development has commenced, and should lead to progressive growth because the people are largely of European origin. It is estimated that about 73 per cent. of the population are Argentine-born of full European parentage, mainly Spanish; about 23 per cent. are foreign-born and generally of European parentage, and the residue are of mixed and inferior blood.

That the progress of the country was considerably delayed will be realised when it is remembered that a Spanish mariner, Juan Diaz de Solis entered the River Plate early in 1516, and after travelling up the river for 115 miles, landed to take possession of the country for Spain. After several other expeditions had visited the country, Don Pedro de Mendoza was appointed the first Adelantado of the country, *i.e.*, "a military leader who defrays the cost of an expedition, and governs and administers the territories he may acquire," in the year 1535, and in January, 1536, reached the River Plate with eleven ships and about 2,000 troops, and started the settlement which was eventually to grow into the city of Buenos Aires. The fighting of native Indians, and the search for metals and wealth which could be transferred to Spain, went on for some very long time, until the people began to desire, and then to fight for, their independence from Spanish control, and just before the River Plate, now Argentina, officially declared its independence, Carlos de Alvear, the Director of the River Plate, tried to persuade Great Britain, through the British Ambassador at Rio do Janeiro (Lord Strangford), for the assumption by England of a Protectorate over River Plate. This was declined because England had no desire to endanger her good relations with Spain. Had it been accepted, recent English and Argentinian history would have been, in all probability, much different. Although the formal Declaration of Independence



Map of Argentina, showing location and boundaries of the Provinces and Territories into which the country is divided.

was passed at Tucuman on 9th July, 1816, and the Federal Constitution drawn up in 1853, the fighting and revolutions continued, and close co-operation could not be brought about until 1880, when Buenos Aires was chosen as the National Capital, and comparative peace has remained the order of the day. The growth of the population of the Capital City—Buenos Aires—gives some idea of the rapidity of the development of the country, for it is estimated that in 1880 this city had a population of 300,000 persons, whereas at present, 1935, it is over two and a quarter millions.

All through this long struggle to make a nation of Argentinians, foodstuffs were being produced for the residents, and so some of the land close to the older cities must have been cropped for hundreds of years, although at present there are few indications of such long-period cropping. Other than the evidence of old buildings the countryside looks as though it was settled in recent times, and the agricultural production is so high that the impression of "new" country with high potentialities is also gained.

That the agricultural production is really high is easily realised by a glance at the following tables, setting out the most recent official figures of the yields and exports of crops and livestock for Argentina:—

AGRICULTURAL PRODUCTION IN ARGENTINA.

¶ *Principal Crops in* 1933-34.

Crop.	Area Sown.	Production.	Exported, 1934.
	Acres.	Tons.	Tons.
Wheat	19,654,531	7,663,965	4,718,006
Maize	16,089,580	5,807,762	5,364,675
Linseed	6,850,619	1,564,878	1,352,741
Oats	3,564,951	819,839	497,878
Barley	1,781,784	771,613	527,623
Rye	1,767,334	233,255	104,028
Canary seed	116,954	35,431	25,309
Vineyards	386,901*	—	—
Wine	—	172,458,000 gallons.*	Importer
Grapes	—	—	6,674
Cotton	342,095*	31,997	26,683
Peanuts	221,287	102,258	603
Rice	47,202	32,981	Importer
Potatoes	392,183	904,781	30,913
Yerba Maté	111,066*	50,238	Importer
Sunflower seed	—	—	9,759
Rape seed	—	—	4,095
Sugar (cane)	386,365*	313,872	1,685
Tobacco	29,847	9,956	Importer
Lucerne	13,353,907	—	3,812§
Wheat flour	—	1,318,863	108,670

* 1932-33. § Seed.

¶ "Boletin Mensual de Estadistica Agropecuaria"—January, 1935.

Note.—In translating the table into English the figures used were:—hectarea 2.47 acres, and "tonelada = 0.9842 ton.

Principal Livestock Products in 1933 *and* 1934.†

Livestock and Products.	1930 Census.	1933, Slaughterings.		Export, 1934.
		Home Consumption.	Export, 1933.	
	No.	No.	No.	
Cattle	32,211,855	3,984,851	1,718,142	—
Sheep	44,413,221	2,927,056	4,100,988	—
Pigs	3,768,738	931,080	311,305	—
Horses	9,858,111	—	—	—
Goats	5,647,396	—	—	—
Asses and Mules	1,039,420	—	—	—
		Production, 1933.	Tons.	Tons.
Wool—				
Greasy	—	Tons.	142,145	96,021
Washed	—	162,393	not shown	13,254
Butter	—	32,077	13,690	8,191
Cheese	—	22,983	—	1,473
Casein	—	21,298	—	20,011
				Doz.
Eggs	—	—	—	1,870,317
Beef—				Tons.
Chilled	—	—	344,514	344,120
Frozen	—	—	31,051	31,095
Sheep—				
Frozen	—	—	61,183	47,826
Chilled	—	—	—	165
Pork, Frozen	—	—	—	14,823
Conserved Meat	—	—	54,126	60,090
Salted Meat	—	—	—	6,856
Meat Powder	—	—	—	12,431
Meat Extract	—	—	24,813	1,506
Small-Goods (Meat, Frozen)	—	—	—	23,899
Tallow and Melted Fat	—	—	71,131	60,647
Dried Blood	—	—	—	10,767
Hides—				
Salted	—	—	110,485	103,576
Dried	—	—	16,098	18,629
Sheep Skins	—	—	20,408	16,870
Bones	—	—	—	41,923
Hair and Bristles	—	—	—	3,912

† "Boletin Mensual de Estadistica Agropecuaria"—January, 1935.

Note.—In translating the table into English a tonelada was taken as 0.9842 ton.

THE PRINCIPAL CROPS PRODUCED IN ARGENTINA.

There are no crops of real importance to the world, except a few which must be produced near the Equator, that cannot be grown really well in Argentina, and most of them are being produced now in the country, but at the present time those of outstanding importance are Wheat, Maize, Linseed, and Grapes for Wine, with Cotton, Peanuts, Canary Seed and Yerba Maté rapidly coming into prominence.

The preceding table, dealing with crops, shows very clearly how important some of these crops are, but naturally figures cannot show how important any, or all of them, are likely to become in the future, and without doubt all can be multiplied to an almost unbelievable extent in this country as the population grows, or as market requirements expand.

WHEAT IN ARGENTINA.

Argentina is one of the most important of the wheat-producing countries of the world, being in seventh position as a producer, averaging of late years something over 200,000,000 bushels per year, and being the second most important exporter of wheat, with Canada as the only country with a greater export surplus. The export of wheat varies according to season, but reaches about 150,000,000 to 170,000,000 bushels per year.

Wheat is grown in Argentina in a conveniently compact belt, all of which is in contact with the important grain-shipping ports of Rosario, Bahia Blanca, Buenos Aires, Santa Fé, and La Plata. This area of country is almost fan-shaped with Buenos Aires as the radiating point, and extends a bit below Bahia Blanca in the south, as far west as the eastern boundary of the Province of San Luis, and to the north-east corner of the Province of Córdoba in the north. This more or less oval-shaped strip of country is about 600 miles long from north to south, and about 420 miles wide from east to west, and is all cultivable for wheat-growing, except about one-fifth of the Province of Buenos Aires on the coast side. The wheat belt includes all of the Province of Buenos Aires except the small piece mentioned, the southern half of both the Provinces of Entre Rios and Santa Fé, two-thirds of the Province of Córdoba, a small piece of the Province of San Luis, and one-third of the Territory of La Pampa.

Except the relatively small area in the southern extension from Bahia Blanca to Viedma, which is only about 150 miles long by about 50 miles wide, and has from 16 to 22 inches of average annual rainfall, the whole of this big block of wheat-growing land, covering about 160,000,000 acres, receives between 24 inches of average annual rainfall and 48 inches. A glance at the preceding table, setting out the rainfall recorded throughout Argentina, will show for the provinces forming the wheat belt how every favourable is the distribution of this rainfall, at all events in so far as the encouragement of growth is concerned.

Seasonal Variation in Argentina.

Although the average annual rainfall of the wheat-growing belt is high, and the distribution throughout the year is really good for promoting strong growth, it is naturally subject to some variation, and occasionally the rainfall is so much below normal as to seriously affect the crop and consequently the amount available for export. That this variation can be great is readily seen in the following table, wherein is set out the wheat crop harvested each year in Argentina since the 1928-29 season:—

Seasonal Variation in Wheat Yields in Argentina.

Season.	Area Sown.	Grain Harvested.
	Acres.	Tons.
1928-29	22,770,930	9,349,620
1929-30	20,465,432	4,354,719
1930-31	21,274,110	6,221,951
1931-32	17,277,530	5,884,729
1932-33	19,782,230	6,452,415
1933-34	19,654,531	7,663,965
1934-35	18,804,110	‡6,751,612

Note.—In translating the table into English the figures used were:—hestarea = 2.47 acres and tonelada = 0.9842 ton.

Soils and Wheat-growing Methods.

The soils of the wheat belt are extremely fertile and very regular in character; as a matter of fact, in a general sort of way they could be put in two classes—the rich chocolate-coloured alluvial soils of a friable silty nature, derived from the deposit of the disintegration of the rocks of the Andes, of which the great bulk of the area is composed, and the free-working calcareous soils of the relatively small area used for wheat-growing where the average annual rainfall is less than 20 inches. All of the soil is really good, the great bulk of it being suitable for the production of market garden crops, let alone wheat, and this so so much so that no fertilisers of any kind are used for the production of crops, despite the fact that some of the area has been cropped for a few hundreds of years.

Considering the enormous extent of very fertile, easily-worked soils in such a favourable climatic zone, it appears surprising that the average annual wheat yield of Argentina is only about 13 bushels per acre, but this is a passing phase, and wholly the result of the unsettled nature of the people until recent times, and a rapid improvement can be looked for in the near future if market conditions admit of it. At present a great deal of the wheat is grown by share-farmers working on the large holdings of cattle-raisers, and as in many cases the agreements are for very short periods, even as low as a one-year term, efficient methods cannot be looked for. Even on crop-growing farms the natural conditions are so good that there has been no need in the past to consider seriously the need of a reasonable rotation of crops, and as a consequence much of the land has been so overcropped that weeds and lowered surface fertility lead to light cereal crops.

Hot Water Apparatus for Pickling Seed Wheat, as used by the Department of Agriculture of Argentina. Although this method of treatment was considered in all important wheat-growing countries as the ideal method for the control of "bunt," few people used it other than for small samples of seed. Now that dry powder treatment has become popular, the hot-water treatment has been discontinued.

It was not unusual to hear of rotations like linseed, wheat, linseed, wheat, or even several crops of linseed in succession, then a wheat crop, or of maize, linseed, and wheat grown without any attempt to crop them in regular rotation, and this sort of cropping continued for long periods of time with no resting of the land, and no effort to clean the soil of weeds by a properly worked bare fallow. In all probability this low-yield stage will soon be overcome because the Department of Agriculture is active in wheat-culture work in all directions, and its propaganda should soon be effective.

Types of Wheat Grown in Argentina.

No attempt is made in Argentina to grow any considerable quantity of the type of wheat common to Australia, but the small-grained red wheats rich in protein are the rule in this country. There is, of course, no need for Argentina to encourage this type of wheat for her own requirements, because where proteinous foods, such as meat, milk, eggs, butter, &c., are plentiful, and where vegetables, greens, etc., can be grown so easily, any wheat with fair strength which will make a good-looking white loaf is sufficient. On the other hand, when the market is over-full of wheat, the samples with high strength sell better than the poorer types, and Argentina is concentrating on the wheats with high strength.

All of the Government Experimental Farms where wheat is grown are endeavouring to breed or select heavy-yielding wheats of high strength suitable for local conditions, and some of the newer varieties are promising as improvements on the well-known kinds commonly grown. Besides breeding work, these institutions are endeavouring to distribute amongst wheat-growers seed wheat of really good quality, and to help them in this matter they have installed the large, expensive Schule Grain Graders, which enable the removal of all seeds other than wheat, including 100 per cent. of barley.

Home Consumption of Wheat in Argentina.

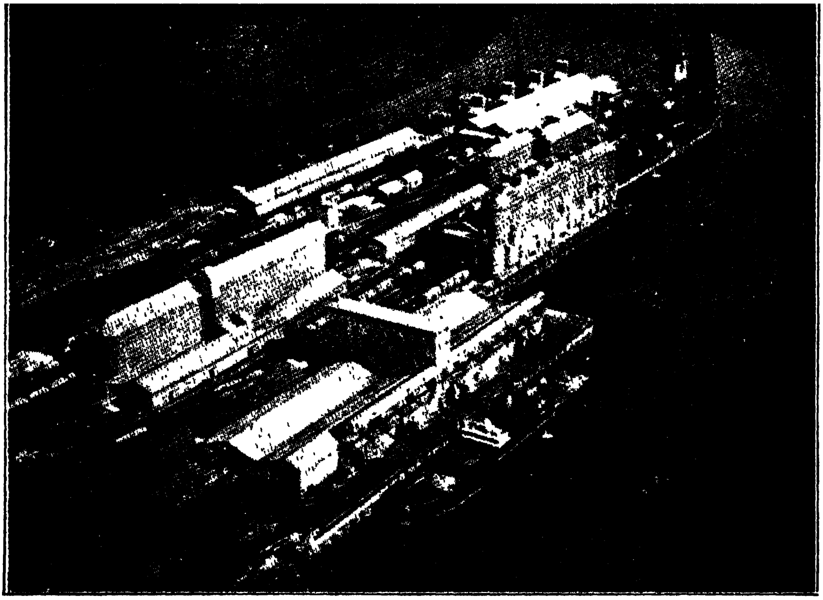
Although Argentina produces a very great quantity of maize and meat, and eats a lot of meat, her people also consume just about a similar amount of wheat per head of population as do Australians. The total consumption within the country for all purposes is about 2,440,000 tons per year, of which something approaching 6 bushels per head of population is used for human and livestock consumption, and the remainder, about 1¼ bushels per head, for seed.

Handling the Wheat Crop.

Terminal elevators are provided at the principal shipping ports of Argentina by the Grain Merchants or by the Railway Companies, but as relatively few of the country receiving centres have yet been equipped with grain silos, most of the wheat is received at the terminals in bags, which have to be opened, and the grain shot into the receiving bins. This shortage of country grain-silos is being corrected, because the Grain Merchants are erecting silos as quickly as opportunity offers, and the Government intends to use some of the money being made from the controlled rate of exchange on primary-product exports for a similar purpose. The Terminal Elevators in Argentina are modern structures with up-to-date equipment capable of handling all of the principal kinds of seeds exported from the country, including Wheat, Maize, Linseed, Barley, Oats, Rye, and Canary Seed. The Terminal Elevators erected at Bahia Blanca by the Argentina Southern Railway Company are quite modern, and although the capacity is not as great as some others in the world, the grain-cleaning apparatus attached to the concern is reputed to be of greater capacity than in any other grain elevator. Another modern well-equipped and efficiently controlled grain elevator inspected in detail was that of Messrs. Louis Dreyfus & Co. Limited, of Rosario.

When wheat is being shipped through terminal elevators nothing is done to it other than transferring it from bags into the ships as loose wheat unless the seller so desires, but if arrangements have been made it will be properly cleaned and graded, and quite a fair proportion is treated in this way.

Much of the wheat crop of the country is cut and put through a stationary power-thresher, the grain is bagged, carted to the railway siding, and trucked to the port of shipment. A wheat receiving railway siding in the wheat-carting season looks much the same in Argentina as in Australia, for at these places there are several large stacks of bagged wheat in course of erection with buyer's agent at each, and in almost all yards are to be seen waggon-loads of wheat waiting to be unloaded. At one siding, fairly close to Bahia Blanca, over 30 waggon-loads of wheat were waiting their turn to be unloaded, and as it was still fairly early in the morning many of them must have got a very early start. Instead of weighing the bags of wheat on scales on a platform at a convenient height for the wheat-lumpers to take the bags on their backs, the scales are frequently placed on the ground and two assistants are necessary to lift each bag on to the wheat-lumper's shoulders. Sheds are not provided in many railway station yards for wheat, but the bags of grain are built into rectangular stacks with gables, most of them being 16 bags high to the eaves, and a further eight bags to the single bag at the gable-ridge. All stacks are protected from rain with tarpaulins, which extend one or more bags down the sides.



[From *Bulletin of the Pan American Union.*

Terminal Elevators controlled by the Argentine Southern Railway Company (F.C.S.) at Bahia Blanca. This huge, modern plant for the handling of grain is not the largest in the world, but is reputed to have grain cleaning and grading equipment with greater capacity than any other grain elevator.

In most ports when grain is awaiting shipment wheat is stacked out in the open and protected from the weather by tarpaulins stretched over the stacks to the ground on each side. At Messrs. Louis Dreyfus & Co. Ltd. shipping yards at Santa Fé the wheat was in stacks 52 bags high to the gable, and well protected by tightly stretched tarpaulins.

The cornsacks used in Argentina are of jute, but much lighter than those demanded in Australia, and although much of the wheat is exported overseas in bulk, a considerable quantity is also shipped in these light-weight jute bags, and the merchants see nothing wrong with them. For the 1934-35 harvest at Casilda, a country town some miles out of Rosario, these three-bushel cornsacks cost 25 cents each, which at present rate of exchange would be the equivalent of something a little more than 4d. each in Australian currency.

Extending Wheat Production in Argentina.

A full knowledge of the agricultural districts of Argentina is necessary for anyone to forecast the possible extension of wheat production, but without any suggestion as to the extent of an increase a casual glance at the country and the study of the figures of production are quite sufficient to convince one that a marked increase will take place as soon as prices of grain warrant it. Other countries with less suitable wheat-growing soils find that wheat can be grown profitably with considerably less average annual rainfall than 24in., as does Argentina herself in the area of country south of Bahia Blanca, and as there is a strip of country almost 100 miles wide between the 24in. rainfall line and the 16in. line, and almost parallel to the edge of the present wheat belt, there is room for expansion here.

With an improvement in present wheat-growing methods, the introduction of better varieties, and the cultivation of further areas not now used for the purpose, there is certain to be a considerable increase in the wheat production of Argentina in the future, the time and the extent of the increase being dependent only upon a reasonable price being obtainable for wheat produced.

MAIZE IN ARGENTINA.

Next to wheat, maize is the most important crop grown by Argentina, and although other countries might grow much more of this cereal, and notably the United States of America with its yield of something around about 3,000,000,000 bushels a year, there is a very big exportable surplus to be sold each year by Argentina. Despite the enormous production of the United States, which almost equals 75 per cent. of the world's annual yield of maize, after all local requirements are met there remains only about 1½ per cent. of the crop available for export, whereas although Argentina produces only about one-tenth of the yield she has considerably more grain for sale overseas than has the North American States. Since 1909 the maize crops in Argentina have given the yields set out in the following table, wherein is also shown the surpluses available for export:—

Maize Production in Argentina. ¶

Average of Five-Year Periods.	Area Sown.	Production.	Export.
	Acres.	Tons.	Tons.
1909-1913	8,706,429	4,792,463	2,693,747
1919-1923	7,988,245	6,918,926	3,047,517
1924-1928	10,585,284	6,310,227	5,331,491
1929-1933	14,560,848	7,498,416	6,295,512
1933-34 (season)	16,089,580	5,807,764	5,384,675
1934-35 (season)	†17,364,100	—	§ —

† Estimated.

§ When harvest was well advanced the estimated surplus for export was about 7,500,000 tons.

¶ From "Boletin Mensual de Estadistica Agropecuaria"—January, 1935.

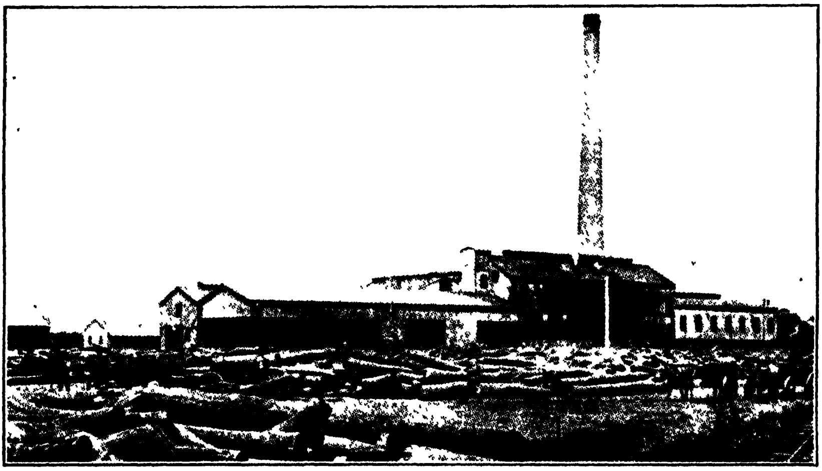
Note.—In translating the table into English the figures used were:—hectarea 2.47 acres and tonelada = 0.9842 ton.

Maize-growing Districts.

The district described as the wheat-belt of Argentina is almost identical with the maize-growing districts, the only noticeable differences being that the area extends northwards into the Province of Santiago del Estero, where a good lot of maize is grown, and but little of the crop is raised in the Territory of La Pampa. The distribution of the 17,000,000 acres or so seeded to maize in Argentina is estimated to be as follows:—

	Per Cent.
Province of Buenos Aires	36.8
Province of Santa Fé	39.8
Province of Córdoba	18.7
Province of Entre Rios	0.8
Province of Santiago del Estero	1.2
Province of San Luis	0.1
Other Provinces or Territories	2.7

The three most important maize-growing Provinces provide 95.2 per cent. of the area sown to the crop, and they are nearly as important for wheat-growing, for about 89 per cent. of the area sown to wheat each year is divided amount these three Provinces.



[From *Bulletin of the Pan American Union.*

Quebracho Logs recently arrived at factory from forests to the north of Argentina. Quebracho is a particularly hard wood and very resistant to exposure in unprotected positions, and so is extremely valuable for railway sleepers, fencing posts, &c Besides its long life Quebracho is rich in tannin, and as logs and tannin extract forms an important export article for Argentina.

The Maize-growing Conditions.

It is difficult to imagine better maize-growing conditions than exist over an area approaching a couple of hundred of millions of acres in Argentina, for here are to be found very fertile, free-working, chocolate-coloured soils, from 1ft. to 2ft. in depth, resting upon sufficiently well-drained subsoils to prevent water-logging, and receiving from 25in. to 45in. of average annual rainfall, of which 85 per cent. to 95 per cent. is distributed fairly evenly throughout the spring, summer, and autumn months. The maize-growing conditions are so good that no particular attention is given to most of the crops, yet of the important maize-producing countries of the world Argentina probably has received the highest average yields of recent years.

The one great disadvantage which maize growers in some parts of the country have to contend with frequently and regularly are the attacks of locusts, and this pest is a real menace in some localities, and does some damage in other districts more or less frequently. In most Provinces where Locust plagues are of frequent occurrence Laws are in existence compelling landholders to make war on the insects, and the damage done appears to be kept within economic limits in most cases.

Types of Maize Grown.

Argentina has concentrated on the production of the Flint type of maize, and growers have been encouraged to do so by merchants and Departmental officers, and with such success that although different-coloured varieties are grown the type has been maintained to such an extent that the terms "Plate" and "Cincuentino" maize have almost come to mean dry, hard, flinty maize. The growing of a certain "Dent" variety of maize which is so objectionable to locusts as to be known locally as "bitter" maize might affect the position, for growers are interesting themselves in this variety; on the other hand, Agricultural Research Officers attached to the Department of Agriculture and others on the staff of the University of Buenos Aires are working on the matter with the hope of breeding varieties of maize of heavy-yielding power, with flinty grain, and as resistant to locusts as is the "bitter" maize.

Harvesting the Ripe Maize.

It is a common practice for maize growers to have a small plot of one of the tall-growing sorghums, with strong straight stems, and when the maize is ripe the sorghum is cut at ground level and the stalks are used in the construction of the crib to hold the corn cobs. These sorghum stalks are fixed upright on a circle, touching one another, and are kept in position by loops of wire, and so make a cylindrical cob crib.

The ripe maize cobs are picked by hand, husked and bagged, for which the workers receive 1 peso for two bags, each to weigh at least 154lbs., and a good man can collect eight to 10 bags a day. For sterling brought into the country a peso is worth about 13d.

In some places maize is grown for the fattening of pigs, and when the crop is ripe slips are given the run of lucerne fields and maize crops at the same time, and remain there, harvesting their own grain, until ready for market.

Increasing Argentina's Maize Crop.

There seems to be every reason why the maize crop of Argentina can be increased to a very considerable extent when economic conditions permit of it. Only a relatively small proportion of the suitable land in the recognised maize-belt is now cropped with maize, and in many cases soil preparation and after-seeding attention are hardly what are generally recognised as being the most modern. Even in really good maize-growing districts, crops in all stages from young plants 6in. in height to the dry stover of already harvested stands are to be seen. It is extremely difficult to try to imagine what will be the increased yield of the present maize-belt when such things as soil preparation for seeding, time of seeding, spacing of the plants, control of weeds, inter-row cultivation, and manuring, &c., are understood and appreciated, and the certainty of a very greatly enlarged total production when other suitable country is utilised for maize growing, after clearing of bush, draining of land, and the application of irrigation water, seems to be assured.

LINSEED IN ARGENTINA.

Of oil-yielding crops Argentina has become a very prominent producer, and particularly in so far as Linseed is concerned, for the Republic grows much more than any other country, and as a matter of fact her production of this valuable seed almost equals that raised in all the remainder of the world. The progress made in this crop-growing activity has been very great and the area sown to Linseed is double nowadays to what it was as recently as 1911, when 4,026,100 acres were seeded to the crop, whereas 8,099,130 acres were sown in 1934.

The importance of the crop to Argentina is shown in the next table:—

Linseed Production in Argentina. ¶

Average of Five-Year Periods.	Area Sown.	Production.	Export.
	Acres.	Tons.	Tons.
1909-1913	4,111,769	777,968	677,136
1919-1923	4,544,751	1,257,624	1,033,144
1924-1928	6,759,170	1,830,154	1,541,363
1929-1933	7,496,094	1,709,074	1,544,075
1933-34 (season)	6,850,619	1,564,878	1,352,741
1934-35 (season)	†8,099,130	1,801,086	—

† Estimated.

¶ From "Boletin Mensual de Estadistica Agropecuaria"—January, 1935.

Note.—In translating the table into English the figures used were:—hectarea = 2.47 acres and tonelada = 0.9842 ton.

Although so much Linseed is grown in Argentina, this country hardly makes enough Linseed Oil to meet her own requirements, for besides making 4,148 tons of oil in 1933, she imported 115 tons, and in 1934 only exported 32½ tons of oil.

Increasing Argentina's Linseed Crop.

The Linseed crop of Argentina is grown in the same strip of country as are wheat and maize crops, but the Province of Entre Rios is the second most important linseed-producing Province, although not so prominent with wheat and maize. The Province of Santa Fé produces about one-third of the Linseed of the Republic, then after Entre Rios, the Provinces of Buenos Aires and Córdoba are the most important.

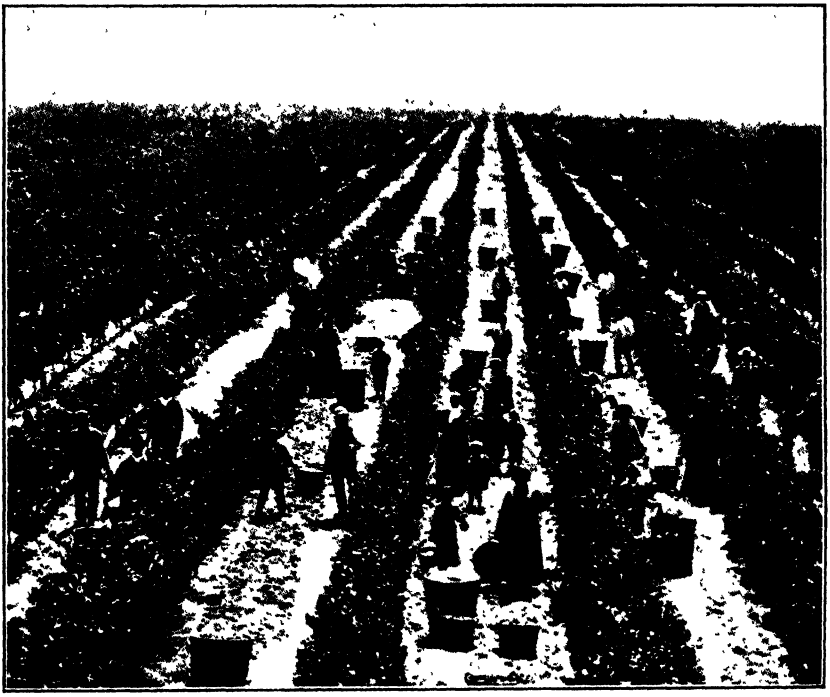
The possibilities of increasing the production of Linseed in this wonderful country are very similar to those existing for Maize. There is still plenty of ideally-suitable land inside the climatic zone favouring this crop which has not yet been brought under the plough, and there is considerable room for improving the linseed-growing practices. A knowledge of varieties and their adaptability to different localities is just being gained, and considerable work in selecting and improving varieties is being done by agricultural research workers. At Pergamino Experiment Station a selected strain, kept nicely true to type, has consistently yielded considerably more seed to the acre, of recent years, than any other of the well-known kinds grown in the locality, and such things as the extension of an improved strain in the localities where adapted must lead rapidly to improved returns.

VINEYARDS IN ARGENTINA.

Although the growing of grape vines and the manufacture of wine is one of the principal agricultural activities of Argentina, it was impossible to look into the industry in any detail, but from what could be seen and heard very considerable expansion can be brought about if this country ever decides to exploit the overseas wine markets. At present there are 3,971 registered wine cellars in Argentina, and in 1933 they manufactured 172,458,000 gallons of wine, and although 88,242 gallons were exported, 211,398 gallons were imported.

Practically all of the vines in this country are grown with the aid of irrigation, and as there are still plenty of streams of water coming down from the Andes into suitable localities for vine-growing, which are not used at present for irrigation, the opportunities for extension are here all of the time, and advantage will surely be taken of them if and when the time is propitious.

Most of the vines of Argentina are grown in what is known as the Cuyo Fruit District, which embraces the areas forming parts of the Provinces of Mendoza and San Juan, but a fairly considerable quantity of wine is produced in the South Fruit District, in the Rio Negro Irrigation Area, and it is generally conceded that the wines from this locality are of better quality than those from districts closer to the Andes. Of the total of 172,458,000 gallons of wine made in 1933, the Province of Mendoza provided 139,334,800 gallons, the Province of San Juan 18,484,400 gallons, the Territory of Rio Negro 7,436,000 gallons, and the remainder was made up of smaller quantities from other scattered localities.

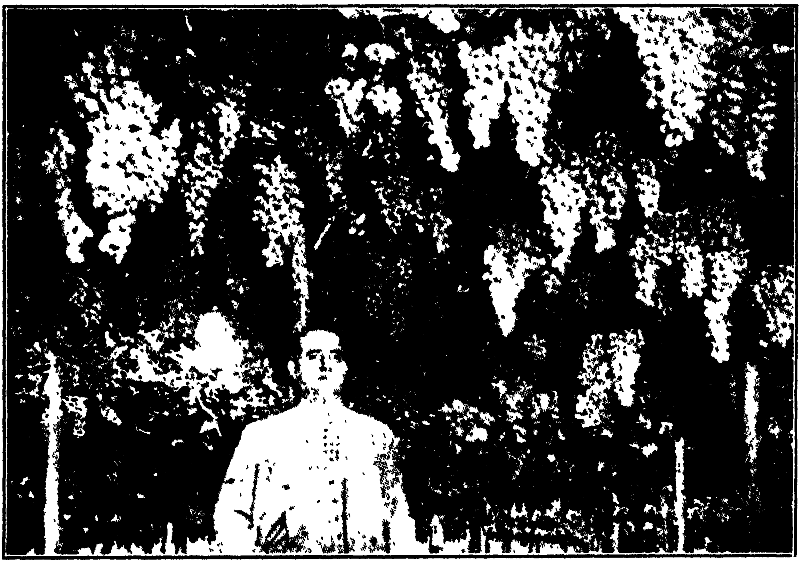


[From *Bulletin of the Pan American Union.*

A View of a small section of one of the large Vineyards of Argentina. Very considerable areas are producing grapes for conversion to wine, and many of the vineyards are really extensive.

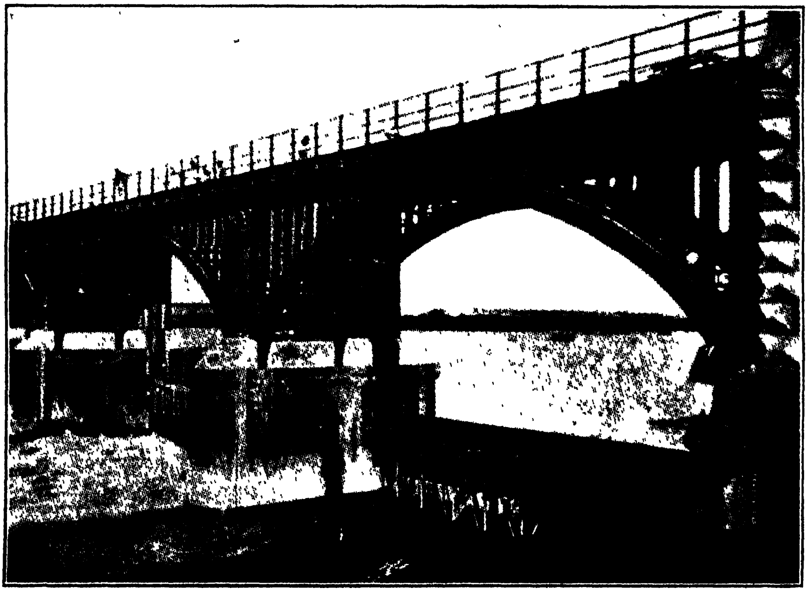
Besides fruit for conversion into wine, grapes are being grown for export as such, and in increasing quantities. Last year, 1934, a total of 6,674 tons of boxed grapes were exported, and this fruit deservedly has a good name, for it is efficiently grown on overhead trellises, carefully picked and packed, and cooled down in the recognised manner to carry well without undue wastage. The varieties being grown for export are:—

Alphonse Lavallee
Emperor
Dattier de Beyrouth
Moscatel
Molivera Gorda
Prune de Cazouls
Santa Paula
Almeria
Lattuario
Ferral
Cornichon
Angelino



[From *Argentine Fruit for Export.*

Grapes for export are grown in Argentina under the most modern and approved systems, and the export of the fresh fruit is assuming important dimensions. Heavy yields and well-developed bunches of large berries are secured with irrigation



[From *Almanaque del Ministerio de Agricultura,* 1935.

Weir and Bridge over the Rio Negro impounding water to be used for irrigating crops in the Neuquen Irrigation Settlement. Apples and pears are the principal fruit crops being produced in this area, with vines of fair importance, and from these some of the best wines in Argentina are manufactured.

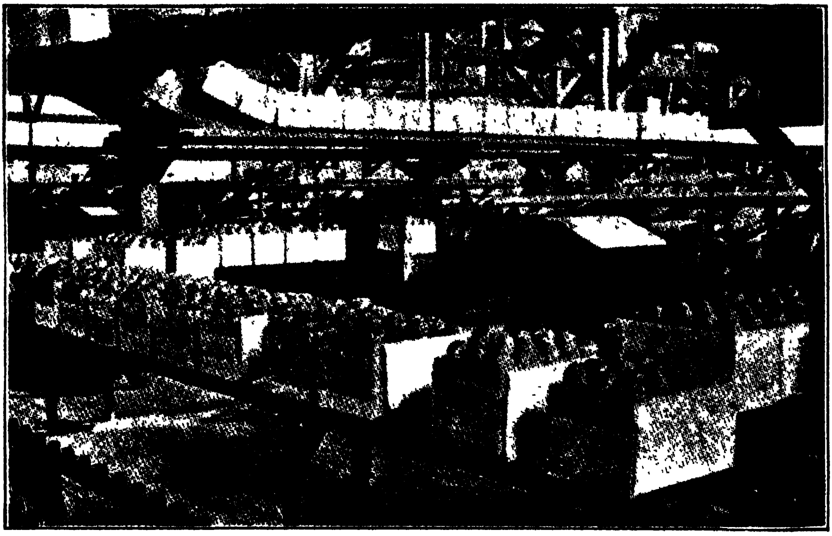
FRUITS IN ARGENTINA.

A recent publication—January, 1935—of the Argentine Republic Ministry of Agriculture, entitled "Argentine Fruit for Export," depicts on the outer cover a man tipping an assortment of fruits on to the top of the world, and given the incentive this form of agricultural production could probably be developed rapidly in Argentina to literally translate this cartoon.

In the Néuquen district of the Rio Negro Irrigation Area are to be seen some of the hundreds of thousands of apple trees originally purchased in Australia by Argentina, and the wonderful growth and production of these varieties in this locality are an eye opener. The varieties consist largely of Delicious, Jonathan, King David, Rome Beauty, and Cox Orange Pippin, with smaller areas of other well-known export sorts. The oldest of the apple trees in this area are 13 years of age, and whole orchards are reputed to be producing from 20 to 30 bushels of export apples per tree. The conditions appear to be almost ideal for apples, and suit pears—Williams, at all events—extremely well. So far "alternate cropping" has not been noticed with any variety, except King David, and even with this it has not been very marked. The fruit trees are grown with irrigation in this low-rainfall district, and although the summer is hot the winter is really cold, and apple trees appear to revel in the conditions. So far few pests have been troublesome, and the only things needing much attention are Codlin Moth, Red Spider, and sun-scald. The locality is very windy, but Poplars are freely used as breakwinds, and although they grow into high trees very quickly only affect the fruit trees close to them by over shading, but do not retard their growth. The orchards are liberally manured, and green-manuring with Tick Beans, King Island Melilot or Vetches, is carried out nearly every year. After the green manure has been ploughed in, the land is left uncultivated, the reason given being that the weedy, shaded surface reduces the amount of sun-scald. Tamarisk is used a good deal in this area, as in many other parts of Argentina, but it encourages the Basket Moth, which in some years does so much damage to fruit and ornamental trees, to such an extent that its popularity is on the wane.

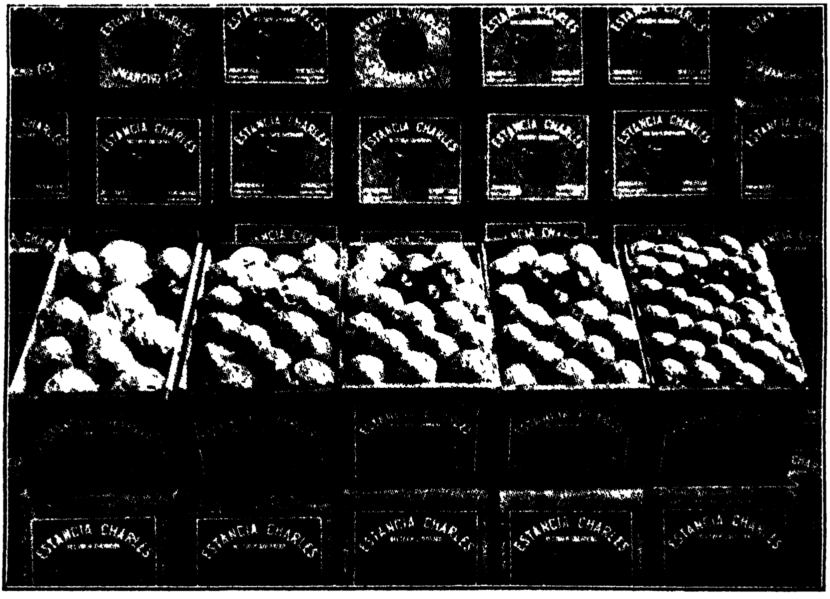
[From *Argentine Fruit for Export.*

An Apple Grading and Packing Shed in a fruit growing district of Argentina. Modern equipment, properly arranged in well constructed and suitably-lighted buildings, is to be found throughout the fruit areas of the country.



[From *Argentine Fruit for Export.*

Graded, wrapped, and carefully-packed Fruit travelling towards the nailing machine in a well-equipped fruit-packing shed.



[From *Argentine Fruit for Export.*

A display of Packed Apples, showing different counts, careful wrapping and packing, and attractive labels on the standard export cases.

In the Cuyo District (Mendoza and San Juan) all kinds of fruits, except Citrus and tropical sorts, are grown in large quantities, and, as at Néuquen, packing-houses have been provided to prepare the fruit for Argentinian and export markets. The orchards in this area are all irrigated, and Experiment Stations and Horticultural Experts are provided to help and encourage growers.

In the Delta district, just near Buenos Aires, in the deep, rich silt brought down by the Paraná and Uruguay Rivers, peaches, plums, apples, lemons, oranges, and quinces are grown in quantity; and but relatively little of this really good gardening country is properly reclaimed. Just south of Buenos Aires and not far from the coast apples, pears, plums, and peaches are grown without irrigation.

Two northern districts are also becoming important fruit-growing localities, but very largely for citrus fruits, the one comprising the country which lies between the Paraná and Uruguay Rivers in the Provinces of Entre Rios, Corrientes, and Misiones, and the other well north in the Provinces of Salta, Jujuy, and Tucuman.

Although some of these fruit growing districts are considerable distances from the ports, the Railway Companies provide cool vans, which have been themselves cooled right down before the pre-cooled fruit is loaded from the local Cold Stores, and these vans then make up special fruit express trains, and a uniform temperature is maintained throughout the long journeys to the port.

[From *Argentine Fruit for Export.*

Examination of Export Fruit at the port of exportation by the Appeal Tribunal. All fruit to be shipped overseas must undergo very rigid inspection, and exporters have the right of appeal to a Special Tribunal should they be dissatisfied with a decision of a Government export inspector.

It appears that Argentina is right on the point of becoming a really important exporter of fruit, at all events of apples and pears. Last year—1934—her total exports consisted of 1,664 tons of pears, 184 tons of apples, 230 tons of peaches, 813 tons of grape-fruit, and 23 tons of oranges and mandarins, but in early 1935 about 270,000 cases of pears, and something over 400,000 cases of apples were stored in the new Cold Stores erected by the Anglo-South American Meat Co. just before the season opened, and much of this supply was from the young orchards at Néuquen and Cuyo which are just coming into full bearing. Because of the growth of the industry the National Government, created in February, 1934, what is known as the Division of Control of Fruit Production which is to be a department of the Ministry of Agriculture. The principal duties of the organisation are to educate fruitgrowers, to increase the cultivation of those varieties called for by the consumers, to improve packing methods, to define national grades and qualities, and more important than all, to encourage exportation by every possible means.

Yerba Mate in Argentina.

A crop which is becoming of increasing importance in Argentina, which has no direct interest for South Australia, but probably will prove to have some for other parts of the Commonwealth in the future, is Yerba Maté (*Ilex paraguayensis*).

[From *Bulletin of the Pan American Union.*
Ilex paraguayensis, a member of the Holly family, from which Yerba Mate is procured.

An infusion of this plant has been used for centuries in South America under various names, such as Brazilian Tea, Maté Tea, &c., and judged by the numbers of Europeans living a normal life in South America, who get beneficial results from imbibing this tea, it appears to have some at least of the medicinal properties claimed for it. It is generally considered to have strongly anti-scorbutic properties, so much so that although many of the natives who take this tea regularly, eat very little food other than meat, it is generally stated that scurvy is unknown with them. Plenty claim it as a sure cure for rheumatics of most kinds, some consider it to have an exhilarating effect on the nervous system, it is even thought to have "saved South America from the scourge of alcohol," and it is generally considered by all users of it to keep the bowels functioning correctly and the digestion in good order. Whether it has these properties or not, the fact remains that its use is extending, that commercial concerns have interested themselves in it and have introduced it to most of the cities of the world, where it can be purchased to-day, and if Australia does not seriously consider growing some for local use, the country will probably become an importer of a rural primary product grown in a climatic zone similar to what exists here.

That this Yerba Maté is an important crop can be realised by remembering that Argentina uses something like 110,000 tons a year, of which she only produces about 50,000 tons, the difference coming from Brazil and Paraguay.

The plant (one of the Hollies) grows into a tree somewhat similar in appearance to an orange tree, and after the trees have reached five or six years of age, they are pruned in alternate years, the cut-off shoots being kiln dried, crushed, and stored for at least 12 months before being retailed for use.

[From *Bulletin of the Pan American Union.*

Roasting the freshly-cut shoots of Ilex paraguayensis before baling, preparatory to marketing the crop.

Much of the Yerba Maté of commerce comes from trees growing in a state of Nature, and as these are only found in the sub-tropics in Brazil, Paraguay, and Northern Argentina it could hardly be expected that Yerba Maté grown in a different climatic zone would produce an article of a similar quality to that well known at present, and so we cannot expect to grow the crop in South Australia with any chance of success.

OTHER CROPS OF IMPORTANCE IN ARGENTINA.

Most crops required by the country are grown in the country, the exception being, that only about half of the Yerba Maté and Tobacco used are locally grown; about two-thirds of the rice required is imported; some fruit, mainly pineapples and bananas, must be brought over the border; and despite the very high production a little wine is imported as well. Other than these crops, very little of any agricultural product is purchased by Argentina from outside, and as a matter of fact she exports some, even though it may be a small quantity, of nearly every kind of crop raised, and in some cases quite a lot is sent to other countries.

OATS.

The Oat crop is a really important one in Argentina, the area sown in 1933-34 being 3,564,951 acres, which is 36 per cent. higher than the 2,616,594 acres grown in 1922-23. The yield secured in 1933-34 reached 819,839 tons, of which 497,878 tons were exported, such figures showing that the crop forms an important part of the agriculture of the country. As more land is brought under the plough in Argentina, a greater area will probably be seeded to oats than at present, but there seems no reason why this particular crop should ever become more important, relatively to other forms of cropping, in this country.

BARLEY.

Although Barley is not at present as important as Oats in Argentina, its progress has been greater of recent years, for the area sown to it has increased from 598,901 acres in 1922-23 to 1,781,784 acres in 1933-34, which is 2.98 times as great. The yield secured in 1933-34 was 771,613 tons, of which 527,623 tons were exported. Argentina possesses a fairly considerable area of country suitable for the production of Barley of fairly good malting quality, and the crop is likely to become of increasing importance.

[From *Bulletin of the Pan American Union.*

Pressing and baling Yerba Mate in readiness for transporting to market.

RYE.

For a country which grows Wheat, Maize, and Barley so well, the very rapid increase in the area sown to Rye, from 365,683 acres in 1922-23 to 1,767,334 acres in 1933-34, or 4.83 times as much, is rather surprising. The yield obtained in 1933-34 was 233,255 tons, of which 104,028 tons were exported. The crop could easily be extended to a very great extent if desired, but it is doubtful if it will ever become relatively more important than at present.

CANARY SEED.

Canary Seed or Bird Seed as it is sometimes called, is grown in increasing quantities in Argentina, and largely for export to other countries. In 1933-34 the area sown to the crop was 116,954 acres, which returned 35,431 tons of seed, and of this 25,309 tons were exported. As this crop is easy to grow in really good cereal-growing conditions it will not be difficult for Argentina to increase her production of this crop if market conditions warrant it.

COTTON.

It has been estimated that there are over 100,000,000 acres of land in Argentina, in suitable climatic conditions, which some day can be used for the growing of Cotton if it ever becomes desirable. In 1933-34 the area seeded to the crop, mainly in the Territory of the Chaco, was 342,095 acres, and of the yield of 31,997 tons of fibre, some 26,683 tons were exported, most of it going to Liverpool.

PEANUTS.

The Peanut is rapidly becoming more important throughout the world as a direct foodstuff, as a vegetable-oil producer, and as a vegetable paste for use where animal fats are scanty, and this applies to Argentina, as to so many other countries. Although the area under the crop reached 221,287 acres in 1933-34, which yielded 102,258 tons of nuts, practically all was required within the country, for there was a surplus for export of 603 tons only. The sub-tropical zone with good agricultural soils of fairly light texture is so great in Argentina that this crop can be increased to any desired extent almost.

[From *Cartilla Argentina*

An extensive grove of young Ilex paraguayensis trees in Argentina Imports of Yerba Mate have been so great that the authorities are making strenuous efforts to produce the requirements of the country in suitable locations in North Argentina.

RICE.

On the 47,202 acres of land seeded to Rice in 1933-34, a yield of 32,981 tons was secured, which was only about one-third of the amount required for local consumption. The deficiency can easily be made up in this country with its plentiful water supply in both sub-tropical and semi-arid climatic zones.

POTATOES.

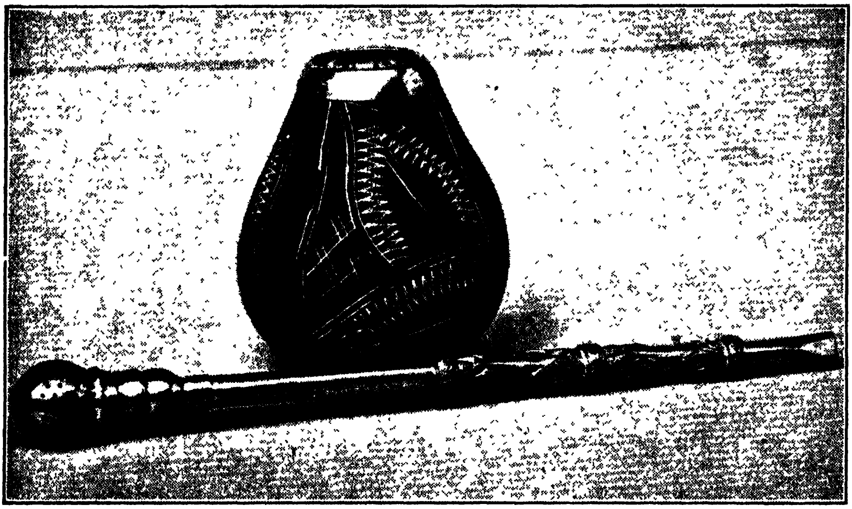
Argentina has passed the stage of only growing its own requirements of Potatoes, for she exported 30,913 tons of the 1933-34 crop of 904,781 tons, which were dug from an area of 392,183 acres. So much of Argentina consists of market-gardening conditions that such crops as Potatoes can be grown very easily, and the possible extension of the crop is almost unlimited.

SUNFLOWER SEED.

Sunflowers can usually be grown well where Maize flourishes, and they certainly do so in Argentina, and although there is very little of the crop grown other than in single rows and in relatively small patches, sufficient seed was collected to supply the needs of the country and to permit of the export of 9,759 tons in 1934.

RAPE SEED.

Another vegetable-oil seed which is coming into prominence in Argentina is Rape Seed to the extent that although a lot of oil was extracted in the country, it was still possible to export 4,095 tons of seed in 1934.



[Photo. by Government Photolithographer.

Mate pot and Bombilla. Many South Americans, and more particularly country people, regularly and frequently imbibe Yerba Mate from a Mate pot, which is made from a cleaned-out gourd. Nearly filled with tea leaves, a small quantity of hot water is added, and when this has been sucked up through the Bombilla more hot water is poured into the Mate pot. The process is repeated again and again until the hot water no longer extracts a flavour from the tea leaves, when the tea leaves are replaced by a fresh supply. If a party are imbibing Mate tea the persons present take the tea in rotation, using the same Mate pot and Bombilla.

VEGETABLE OILS.

Quite an assortment of vegetable oils are produced in quantity in Argentina, and in all cases to the extent of supplying local needs and leaving a surplus for export with the exception of Linseed Oil, a little of which is imported.

VEGETABLE OIL MANUFACTURED IN ARGENTINA, 1932.

Factories at work	33
Seed treated	155,061 tons
Oil obtained	36,401 tons
Yield of oil	23.5 per cent.
Oil cake produced	81,066 tons

Of these oils the principal ones are Peanut, Rape Seed, Cotton Seed, Linseed, and Sunflower, and occupy the following proportions of the total:-

Principal Kinds of Oil Made in Argentina.

Kind of Oil.		1932.			1933.
	Seed Treated.	Oil Obtained.	Yield of Oil.	Oil Cake.	Oil Obtained.
	Tons.	Tons.	%	Tons.	Tons.
Peanut	41,188	12,518	30·4	19,965	13,469
Rape seed	42,012	12,104	29·0	29,292	12,461
Cotton seed	44,547	5,614	12·6	17,947	8,642
Linseed	15,923	4,479	28·1	11,269	4,148
Sunflower	4,403	880	20·0	1,458	2,627
Tártago	2,358	594	25·2	380	455
Maize	4,583	104	2·3	734	—
Olive	46	10	21·9	20	96

THE PASTURES OF ARGENTINA.

The fact that Argentina maintains so many domesticated animals and obtains so much of her revenue from livestock products is a sure indication that her pastures are extremely good. This is certainly so at the present time, when most of the animals are reared on pastures consisting of introduced plants; but even before agriculturists commenced to grow crops for grazing off, the pastures must have been fairly good on large areas of country, otherwise the extensive herds of wild cattle and wild horses would not have developed, let alone the animals retain the size and ability to put on condition which they appear to have done. When cropping was undertaken on a large scale and strong-growing weeds made their appearance in such quantity, it became necessary to establish pastures to replace those destroyed by cultivation. Of the plants introduced, Lucerne was outstandingly successful, but some others are becoming popular, and others have established themselves and play an important part in helping to support the livestock of the country.

LUCERNE IN ARGENTINA.

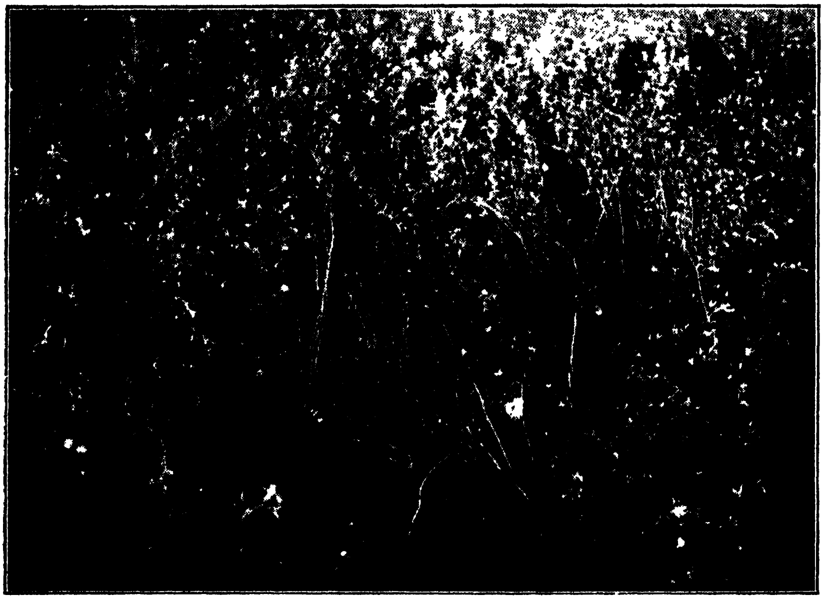
It is almost a certainty that if Lucerne had not proved such a remarkable success as it has in Argentina, this country would not have made the enormous progress in meat production which puts her so much in front of the remainder of the world in this connection. Sub-tropical conditions are notoriously deficient in so far as nutritive value of natural pastures are concerned, and the very few leguminous forage plants indigenous to the conditions, and the difficulty of securing profuse growth of fine-textured legumes introduced into these particular conditions, appear to have a good deal to do with one of the limiting factors of such pastures. In much of Argentina this difficulty was immediately overcome, because the natural conditions obtaining are almost ideally suited to the very prolific growth of Lucerne, and as it is a crop which can be established so easily, advantage has been taken of it, to the extent that in 1933 the area carrying this crop was 13,353,907 acres.

Not only is Lucerne so useful because of its high nutritive value and high protein content, but it is so strong a grower and so hardy that it can compete fairly well with most of the prolific-growing weeds which appear in such rich country, and it is one of the few fodders, other than grasses with root-stocks, which can compete at all well with these pests.

It is difficult to imagine more ideal Lucerne-growing conditions than obtain over tens of thousands of acres in Argentina, for the soils are composed of extremely rich silt, 1ft. to 2ft. or more in depth and of a free-working nature, resting on sufficiently open subsoils to prevent waterlogging and to permit of the penetration of the Lucerne roots. The rainfall varies from 25 inches to 50 inches, and about

30 per cent. of this rain falls in each of the three-month periods of spring, summer, and autumn when the Lucerne requires it. As the temperatures of this area of country are fairly high during the rainy period of the year, the Lucerne flourishes. Some parts of the strip of country are even more favourable for the growth of Lucerne than others because the underground water-table is within reach of the Lucerne roots, and where this is so the growth of the crop is tremendous.

The growth made by the better stands of Lucerne is very striking because not only is the rate of growth really rapid, but the plants grow so tall before they attempt to flower that the quantity of growth made is remarkable. It is of common occurrence to be informed of the six cuts a year on the average, and occasionally some of the fields give up to 10 cuts a year, and when the profusion of the growth is taken into account a realisation of the heavy yields is possible. All of the Lucerne of Argentina does not give yields like those mentioned, nor for that matter do a great proportion of the crops, but the better-cared-for crops do, and it is possible over very extensive areas indeed.



A stand of Lucerne in Argentina at the end of March, 1935. The natural conditions obtaining in much of the Great Plain of Argentina are almost ideal for the production of lucerne.

Judged by Australian standards the values of these lands are extremely low, even when cut into small dairy farms, and an area in one locality right in the really good Lucerne-growing country, was cut up a short while ago into blocks of 80 acres to 500 acres, and these were sold for 300 pesos to 350 pesos per hectarea, which would mean £6 11s. 7d. to £7 13s. 6d. per acre if a person took English money to purchase the land, or £8 4s. 6d. to £9 11s. 10d. per acre if purchased with Australian currency, but if purchased by an Argentinian at par would cost the equivalent of £12 13s. to £14 15s. 2d. per acre in Australian currency. Some of this land is being rented by dairy farmers who are paying 18 pesos to 22 pesos per hectarea, equal to 7s. 11d. to 9s. 8d. per acre if paid in sterling, and 9s. 11d. to 12s. 1d. per acre if in Australian currency, but these figures would be increased to 15s. 2d. to 18s. 6d. per acre as the Australian equivalent of Argentinian par. This land is carrying a Friesian cow per hectarea (2.47 acres), as well as rearing all calves.

Managing the Lucerne Crop.

Lucerne has been grown so easily in the past that there are no set systems to follow, and it is still being seeded in all sorts of ways, but it appears that in some places, at all events, the hit-and-miss rules are not so effective as they used to be, and reasonable soil preparation and some care is necessary at seeding time. The variations in the methods of establishing the crop are great, as can be realised by the following systems which were encountered:—

(*a*) Maize is grown with cultivation between the rows, then the land is cropped with Linseed for two or three years, and Lucerne seed is put in with the last Linseed crop.

(*b*) As no Maize is grown, Linseed is sown for three years in succession, and in the last crop Lucerne is sown. The Lucerne is left for five years, after which the process is repeated.

(*c*) After the Lucerne has thinned out the land is cropped with Maize, then with Linseed with Lucerne seed mixed at seeding.

(*d*) Where Maize is important there was a case of this crop being grown for four years in succession, then a crop of Linseed seeded with 18lbs. Lucerne seed per acre.

(*e*) On an estancia, where no crops are carted off the land, Rye (or Oats), then Sorghum followed by Rye with 18lbs. Lucerne seed per acre is the method followed, the last Rye crop being fed down heavily.

(*f*) Couch grass (*Cynodon dactylon*) is a very troublesome weed in some Argentina districts, and where this bad weed is prevalent crops of some kind are grown for three or four years before the land is reseeded to Lucerne, but where the Couch grass is not bad the Lucerne is sometimes sown soon after ploughing and harrowing the land.

(*g*) Sudan grass is sown soon after ploughing in the spring, then after feeding-off the crop in the autumn Rye or Oats are sown, fed down heavily, and the land is then seeded with Lucerne in the spring.

All of these methods of seeding the Lucerne crop have given reasonably good results, but on land where the crop has been grown for a long time it is being found that much more care is now necessary to ensure a long-lived stand than was so previously, and as a consequence quite good soil preparation is being given in some cases. The deterioration of the Lucerne crop is usually laid to the blame of the increase in the competition from weeds, but although this is partly true, poor cultivation methods, lack of manure, and over-grazing must carry their share of the blame, and it is not too certain that lack of lime and phosphorus are not as important as all other reasons put together.

Weeds grow very strongly in the best of the Lucerne land and often affect the growth of the crop for a portion or even the whole of a season, but if the fields be cut with a mower after the weeds have a good start, leaving the material to drop, and then have it fired as soon as sufficiently dry, the fields are cleaned very nicely, and in the seasons which admit of this practice much good results.

The Lucerne crop is not subject to many pests in Argentina, but the caterpillars of the yellow moth do some damage, which does not, however, appear to worry growers to any extent. Eelworm is thinning out some stands, and a good deal of work is being done by officers of the Faculty of Agriculture of the University of Buenos Aires in searching for immune strains of Argentina Lucerne.

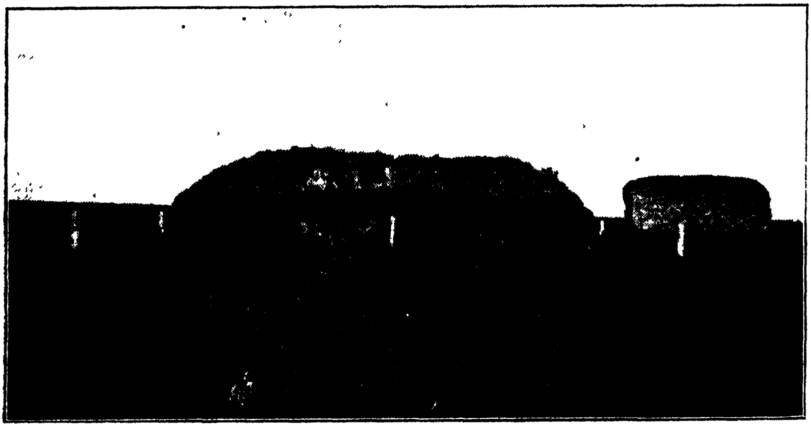
In most districts where irrigation is practised Lucerne is grown with the aid of artificial watering and grows just as well as in other countries where similar methods are followed. This form of Lucerne culture can be extended to an enormous degree some day, but there is still plenty of the good agricultural country which can be brought under the crop without needing to think of the expense of preparing for irrigation.

Storing Lucerne as Hay and Silage.

It is one of the striking things of a tour through the Lucerne-growing districts of Argentina to see the quantities of forage stored as reserves in the form of hay and silage. Not only are stacks to be seen on holding after holding, but the size and number of the stacks, from relatively small areas in some cases, are often very surprising. Lucerne that will grow sufficiently high to admit of easy cutting lends itself to storage either as hay or silage, but when it grows so freely as it does in much of this country the job is relatively easy.

Labour is sufficiently low priced in Argentina that mechanisation as carried out in some other countries is not so necessary, although some of the Lucerne-growers have the most modern hay-handling plants on the market.

Lucerne silage is almost invariably made in stacks built on the surface of the ground, or at most started in shallow pits about 2ft. deep, opened up to get sufficient soil to weight down the stack when completed. A variation from standard method adopted by one estancia manager was to cart all of the material into the stack with horse-drawn sledge, keeping the sides of the stack upright during building, but leaving the ends of sufficiently gentle slope to allow teams to get to the top of the stack. As soon as all material was put on the stack the ends were squared off, the forage in the sloping ends being thrown on top of the stack or carted out to stock, then soil from alongside the stack was thrown on top for weighting purposes. When the stack was to be used the soil from on top was thrown back into the hole from whence it came.



A stack of Lucerne Silage and one of Lucerne Hay in Argentina. Very large supplies of both silage and hay are kept in many parts of Argentina in readiness for the fairly severe short-period droughts which occasionally occur.

CEREALS.

Next to Lucerne the cereals, Rye and Oats, are probably the most important grazing plants in Argentina. One or other, seldom a mixture of the two cereals, is sown in the early autumn, say late February or March, and is grazed as a rule as soon as there is sufficient growth for the animals to get a good bite, but in other cases the crop is left until the calves are weaned when they are put straight on to the cereal. Cattle-men like Rye in autumn and early winter and Oats in late winter and early spring, and find that calves suffer no check from weaning if put on to the cereal crops, and older cattle fatten very quickly. Something about a bushel of Rye is used and close to two bushels of oats; but no fertiliser of any kind is added. Barley is sometimes drilled into Lucerne fields with the object of farrowing pigs on the crop in late autumn or early winter, and good results are claimed for this crop. The cereal crops are frequently grazed down very heavily in the spring and then the land is cultivated and sown to a summer-growing fodder crop.

SORGHUM AND SUDAN GRASS.

Forage Sorghum and Sudan grass are becoming increasingly popular summer-growing forage crops, as it is found that cattle fatten very quickly on either crop if they have the run of a Lucerne field at the time they are grazing down the Sorghum. The crop is sown in the spring through every seed-feeder of an ordinary seed-drill, is fed down close when in head in the autumn and then frequently the land is ploughed and seeded to Rye or Oats for winter feeding. Sorghum and Sudan grass, and particularly the latter, have a fairly pronounced smothering effect on Couch grass, and so help to clean the land so that Lucerne can be re-established.

RHODES GRASS.

In the north where the climate is definitely sub-tropical, South African Rhodes Grass (*Chloris gayana*) is being seeded to a fairly considerable extent, and appears to be giving fairly good results.

OTHER PASTURE PLANTS.

Of the pasture plants being established by landholders, Lucerne and cereals are the only ones of great importance, but there are some introduced plants that ar. establishing themselves over large areas and proving useful for stock, and one or two indigenous plants are spreading since the country has been cultivated or stocked.

COUCH OR BERMUDA GRASS (*Cynodon dactylon*).—Couch Grass has spread over considerable areas of the best agricultural land in Argentina, and although leading to a great deal of trouble when attempting to eradicate it to re-establish Lucerne, helps towards the grazing of such great numbers of livestock. Growing so profusely as it does in this country and with about two-thirds of its growth soft and fairly sappy, it is quite a good pasture plant and is one of the important fodders of the cattle lands.

PRAIRIE GRASS (*Bromus unioloides*).—Prairie Grass appears in much of the Lucerne country when the Lucerne stands begin to thin out, and proves a long-lived plant in these conditions. Cattle-men like it very much, for when there is a noticeable proportion of this grass in the Lucerne, cattle do very much better and the risks of bloating are reduced.

PASPALUM (*Paspalum dilatatum*) is indigenous to South America and is present in quantity in the sub-tropics. Although not artificially established to any great extent, it appears to be spreading, and grows stronger in country that has been stocked for a long time than in newer country.

WATER COUCH (*Paspalum notatum*).—Although Water Couch was only seen in damper locations, some of the patches were of fairly considerable extent, and it is widespread.

JOHNSON GRASS (*Sorghum halepense*).—Johnson Grass is becoming a serious pest in some of the best cropping areas in Argentina, and the Ministry of Agriculture is repeatedly warning farmers to eradicate it or at all events to endeavour to control it. If handled in the proper manner, as some graziers are doing, this grass provides an enormous amount of grazing and animals fatten fairly well on it.

WHITE CLOVER (*Trifolium repens*).—Patches of White Clover are making their appearance in lots of districts and the plants are making strong vigorous growth, and in all probability this wonderful pasture plant will eventually prove of great value in Argentina.

It is a very noticeable fact in the good pasture lands of Argentina that there are few leguminous plants of any kind which are indigenous, and introduced ones, with the exception of Lucerne, are rare. This is usual in sub-tropical conditions, and is a limiting factor to what pastures can do, but the weakness was overcome in Argentina by the success and general use of Lucerne. In some of the undulating country between the Rivers Paraná and Uruguay, and in the calcareous districts on the south end of the Great Plain, Toothed Medic (*Medicago denticulata*), an introduced leguminous annual, appears to grow strongly.

WEED GROWTH IN ARGENTINA.

As is to be expected in such good natural conditions as so much of Argentina is blessed with, the growth of weeds is very profuse indeed, and several of them are rapidly becoming a menace to crop-growing. White Goosefoot (*Chenopodium album*) was seen to be covering hundreds of acres, and had reached a height of 9ft.; whilst on thousands of acres a weed very much like Wild Amarantus had made 4ft. of growth in five weeks after the land was ploughed. Plants carrying burrs abound, particularly one known as Abrojo (*Tribulus maximus*), which produces a plentiful crop of large burrs, and what we know as Bathurst Burr (*Xanthium spinosum*) is there called Cepa ceballo, and is very abundant and strong growing. Another nasty burr is known as Rosetta Burr, and as it is more or less grass-like in appearance, it is not easy to find in luxuriant pastures until the burrs are picked up. Couch Grass has already been referred to as a pasture grass, but this is a very serious pest when it appears in land to be cropped at all frequently, and it covers large areas now and is spreading rapidly. Johnson Grass was introduced into the country for forage purposes, but it has spread so extensively into the rich cropping lands that it is feared that control is impossible, and that the growing of crops will be prevented. Of other troublesome weeds, thistles of several kinds are plentiful and grow very strongly indeed, and there is a long list of annuals, most of which will be kept under fairly easily when good cultivation practices are followed.

LOCUSTS IN ARGENTINA.

Probably the worst pests of the crops grown in Argentina are the Locusts, which reach plague dimensions in some districts practically every year and in others fairly frequently. So much damage is done by these insects that the Provinces concerned and the National Government have legislation dealing with their control. There was a fairly bad attack in 1933, but in 1934 they were even more plentiful, and the damage done was greater. Information in connection with the methods of control undertaken in the various Provinces affected was not available, but what took place in the Province of Entre Rios gives some idea of the severity of the attack and the enormous cost of trying to control the plague. The National Government helps in the payment of costs of destruction of the insects, and in 1933 paid for the destruction of 5,740 tons of eggs dug out of the soil in Entre Rios at the rate of 20 cents per kilo. The burning with flare lamps accounted for 4,000 tons of Locust mosquitos, and it was estimated that 45,580 tons of Locust hoppers were destroyed by leading them into pits sunk along a zinc barrier erected for the purpose of leading them to the pits. During the winter of 1933 4,900 tons of flying Locusts were bagged in the mornings before they again got on the wing, and were destroyed. The above figures apply to one Province only, and as several are affected, and seriously tackle the problem of control, the immensity of the job and the high cost of the operations can well be imagined.

In the Province of Santa Fé, where more or less severe attacks are expected every year, it is compulsory for landholders to provide themselves with zinc sheets for the erection of fences to lead the Locust hoppers into pits dug for their reception. The zinc sheets, which are 39in. long by 16in. wide, together with pegs and clips, are supplied by Government at 25 cents for a sheet, peg, and clip, which at present is considered to be below cost price. When Locust hoppers appear it is compulsory for farmers to fight them to protect their own crops, and if the local authorities controlling the attack decide to erect a long fence between districts, landholders must supply the amount of labour decided upon by the controllers. In erecting fences the zinc sheets are not let into the ground, but soil is thrown against them to prevent the hoppers getting underneath. The pits sunk along the line of fence are from 4ft. to 6ft. in depth, and sometimes the top of the pit is lined inside with zinc to prevent the escape of hoppers if the pit gets rather full. When pits are nearly full the insects are killed by having burning rubbish thrown on them or else they are covered with soil as the pit is filled in.

CONSERVATION OF FODDER.

Although much of Argentina is so very well favoured with climatic conditions almost ideal for the growth of plants she occasionally experiences a short-period drought, and when it does happen that rain is withheld for a few months livestock which have been accustomed to luxuriant pastures throughout their lives suffer very considerably. These short droughts are of fairly rare occurrence, but most of the better-managed holdings guard against them by storing large quantities of forage in the form of hay and silage. This is done fairly easily where Lucerne is grown, because the growth is profuse and is easily converted into good hay and silage.

[From *Almanaque del Ministerio de Agricultura*, 1935.

Filling a pit silo in Argentina. Although Lucerne is usually made into stack silage, other fodder plants are generally stored in overhead or underground silos.

When the first cut of Lucerne with the accompanying weeds is converted into silage the subsequent cuts are very suitable for hay, consisting almost wholly of clean Lucerne. Much of the hay seen was almost 100 per cent. Lucerne, of a good colour and tough cure, but some had obviously been left in the fields too long before carting to stacks.

The Lucerne silage is usually made in stacks, and then if any excavation is made at all it will only be sufficiently deep to provide enough soil to use as weight on top of the stack when completed, and never exceeds 2ft. in depth. All samples of Lucerne silage seen were of really good quality, and would be readily consumed by cattle when it became necessary to use it.

Considerable quantities of both hay and silage are stored throughout the best of the cattle country, and on the appearance of the stacks it was some time since it was last necessary to utilise this kind of foodstuff to feed to the livestock.

On dairy farms where silos are provided maize and sorghum are popular for conserving as silage, and in a few cases Sunflowers were heard of as the crop which was stored in this way.

IRRIGATION IN ARGENTINA.

Time did not permit of an investigation into the irrigation settlements of Argentina, but there are evidences of the possibilities of this form of agriculture in many parts of the country. At present the area being artificially watered is between 3,700,000 acres and 4,000,000 acres, including practically all of the vines, most of the fruit trees, and limited areas of almost all other kinds of crops.

Relatively little has been done in the direction of irrigation considering the enormous quantity of water available and the tremendous area of suitable land in close proximity to the water. The wonderful Paraná River runs for hundreds of miles down the edge of a fertile plain, in warm to hot but equable climate, and admirably suited to irrigation. The Uruguay River runs alongside large areas of fertile land of a gently undulating nature, much of which could easily be watered. Almost countless short streams come from the Andes, some of which have been harnessed for irrigation, but there are many more yet to be controlled. About a dozen important streams traverse from the Andes to the coast the country to the south of the high-rainfall portion of the Great Plain, besides many smaller streams, and several of them pass through country suitable for irrigation. That there are great possibilities of increased irrigation in the low-rainfall country in the south of Argentina can be realised from the Departmental estimate that the 100,000 acres or so being irrigated from the Rio Negro can be increased to 1,000,000 from the same stream.

The melting of the snow of the Andes assures a regular supply of water in the streams in the warm period of the year, and fertile soils with good natural drainage are available in considerable areas, so the possibilities of extending the irrigation activities of Argentina are almost boundess.

ARGENTINA LIVESTOCK.

Besides the very heavy production and export of crops, Argentina possesses natural conditions particularly suitable for the development of livestock, and although this branch of agriculture is not quite so important at present as are her crop-growing activities it is considerable, and, moreover, is capable of great extension in the future. Nowadays about 30 per cent. of the value of the total exports of Argentina is earned by livestock products, which is somewhat below the percentage of past years (42 per cent. in 1912), but a rapid recovery could be made as soon as economic conditions warrant it. The country is blessed with agricultural, freightage, and economic advantages for the production of farm livestock which are much in advance of other countries, and has made full use of these advantages since she has had stable government, at all events in so far as Beef Cattle are concerned, and to a lesser extent with Pigs and Sheep.

That domesticated animals, and particularly meat-producing animals, have reached very important dimensions in Argentina can be gauged by the following figures:—

Farm Livestock in Argentina at 1930 *Census.*

Cattle	32,211,855
Sheep	44,413,221
Pigs	3,768,738
Horses	9,858,111
Goats	5,647,396
Asses and mules	1,039,420
Hens	22,500,000
Roosters	14,928,427
Turkeys	1,937,395
Ducks	1,437,709
Geese	403,296
Pigeons	5,863,164

The levelness of the Great Plain of Argentina, the richness of the soil, the well-distributed heavy rainfall, the close proximity of water to the surface, the favourable climate, and the prolific growth of pastures render a very large area of this country eminently suited to the production of cattle, and this form of livestock farming has been developed to an extent only limited by markets.

(*To be continued.*)

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PIGS AND THEIR MANAGEMENT.

[R. C. Pocock, Lameroo.]

[*Paper read at the 46th Congress of the Agricultural Bureau of South Australia.*]

The breeding and feeding of pigs for the local and overseas markets of to-day, has been so altered in recent times that there still exist in South Australia many farmers breeding and feeding pigs who are not well acquainted with the correct types to which we should give greater attention if we are to produce pork and bacon of a uniformly lean and well-finished character. It cannot be denied that there are many pigs that go to the market each week which are of a class that will not receive very much consideration from buyers, and when cured—although they are bought cheaply, they find little favour with the public—tend, in a general way, to reduce the sale of bacon, especially pigs that are over fat. This feature to-day is the greatest crime of the feeder. Strive to gain uniformity, and this when achieved, will make for greater sales of bacon to the public, because to-day only first class articles command attention.

I do not suggest an "Eat More Bacon Week," but to increase consumption should be the aim of the feeder as well as the curer.

To obtain some of the results suggested, the right breed or cross breed of pig must be produced to fill the bill.

There are some good breeds of pigs that will answer the need and even in each of these breeds, there are many unsuitable pigs. There has been a suggestion made in the Lameroo Branch of the Bureau, for all members to go in for one breed of pigs, the Branch to purchase collectively suitable boar pigs for the use of the small breeders.

BREEDS OF PIGS.

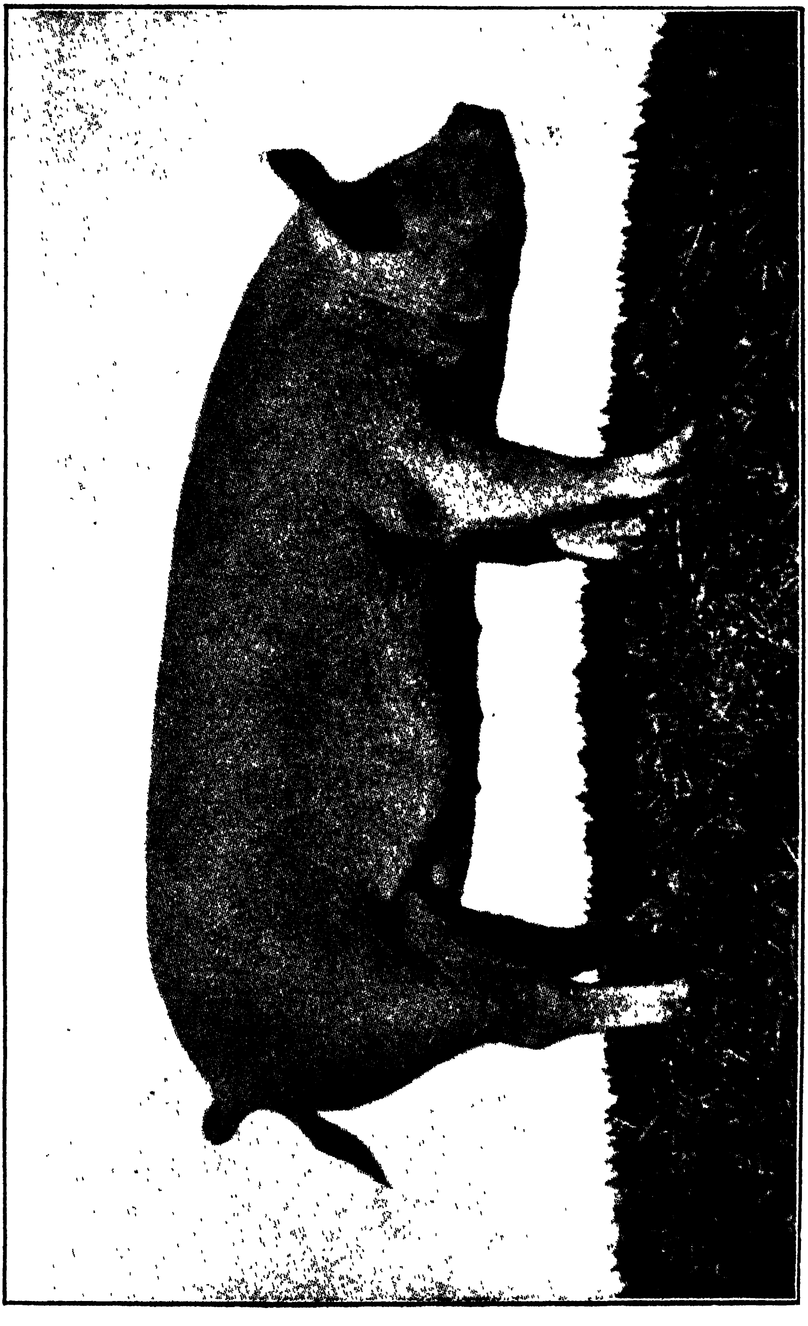
I prefer the White Pigs, because they are even in colour and generally give an even type, are quick growers and do not tend to over-fatten. It is realised that there are other good breeds of pigs, the Canadian Berkshire and Tamworth being very good and by the judicious crossing of these breeds, it is possible to obtain the advantages that come from breeding cross-breds, inasmuch as the young are more numerous and thrive more quickly than the pure-bred pigs of any one breed.

THE ADVANTAGES OF GRAZING.

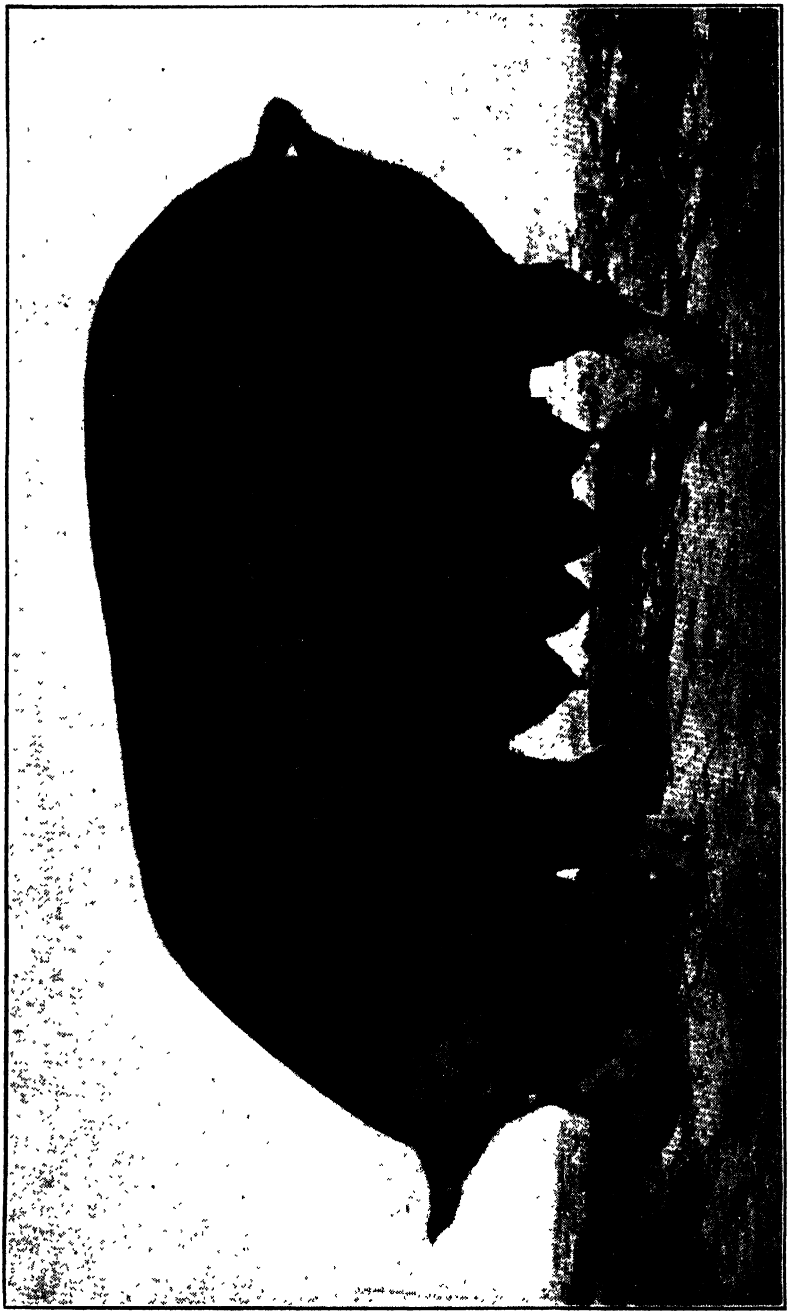
Attention must be given to the best methods of developing the pigs into active, lean and clean bodied animals. This is best done by grazing the pigs in paddocks as much as possible, making them forage for themselves. For sows carrying litters, this is essential. The day of closed-in walled sties for general use is gone. To keep the pigs active is the chief aim, and in the paddocks it is a good plan to make the pigs walk as much as possible, and where water is laid on have the drinking trough at the opposite end of the paddock to that in which the pigs are fed. Of course, with sows, the use of self-feeders is not economical.

FEEDING THE SOWS.

The feeding of sows needs special attention. They should not be allowed to become lazy through over-fatness, but be grazed out in the paddocks as much as possible. When green grass is not available, lucerne or green summer fodder is a great help. When a sow is about to farrow, she should be a little bit on the hungry side, because overfulness is inclined to make the pig uncomfortable. It is when the sow is in this condition that many of the little pigs are crushed. Do not feed the sow until 12 hours after farrowing and then only give a small quantity of sloppy feed. Bran is a good feed, with some milk to encourage the sow to milk well. A good start for the piglets is necessary.



Ideal Type of Pig for present-day market requirements.



Canadian Berkshire Sow "Waitawa Canadian Clarinder" (Roseworthy Agricultural College).

REARING THE LITTER.

In rearing little pigs, milk is almost essential. Of course it can be done without, but milk makes pig rearing easier and more profitable.

To keep sows on the thin side, good fences are necessary. A good fence can be made with barbed wires only. This method is effective and economical.

Little pigs should be castrated at about four weeks so that the wounds will be well healed by the time they are ready to wean.

When the pigs are taken from their mothers, keep them in good heart so that they get no setback. They require sloppy feed until about 12 weeks old, when they can be fed grain and meat meal, at the same time graze them as much as possible.

In winter, a crop of barley sown for the pigs to graze will reduce the ration of grain; the pigs grow quickly when greenfeed is available. The greenfeed is especially useful to sows about to farrow.

It is well to have the sows in the paddocks or sties in which they are to farrow a week or so before the event, so that they will become accustomed to the surroundings and be more contented.

Small paddocks and straw shelters provide the best conveniences for breeding, because the pigs are free and undisturbed, whereas in small confined sties more little pigs are laid on.

A sow should have from 8 to 10 pigs to be profitable; do not keep sows after they have reared about five litters, because as they become older, they make very awkward mothers.

On a farm which is not a dairy farm, and milk is not very plentiful, it is necessary to get the young pigs to do without milk, and as there is a decided tendency for them to fall away in condition very quickly, when getting them to feed on meat meal and grain, every effort must be made to provide for them some sloppy food until they are 12 weeks old. After this age, they will do on the harder feed.

FEEDING COSTS AND MARKETING.

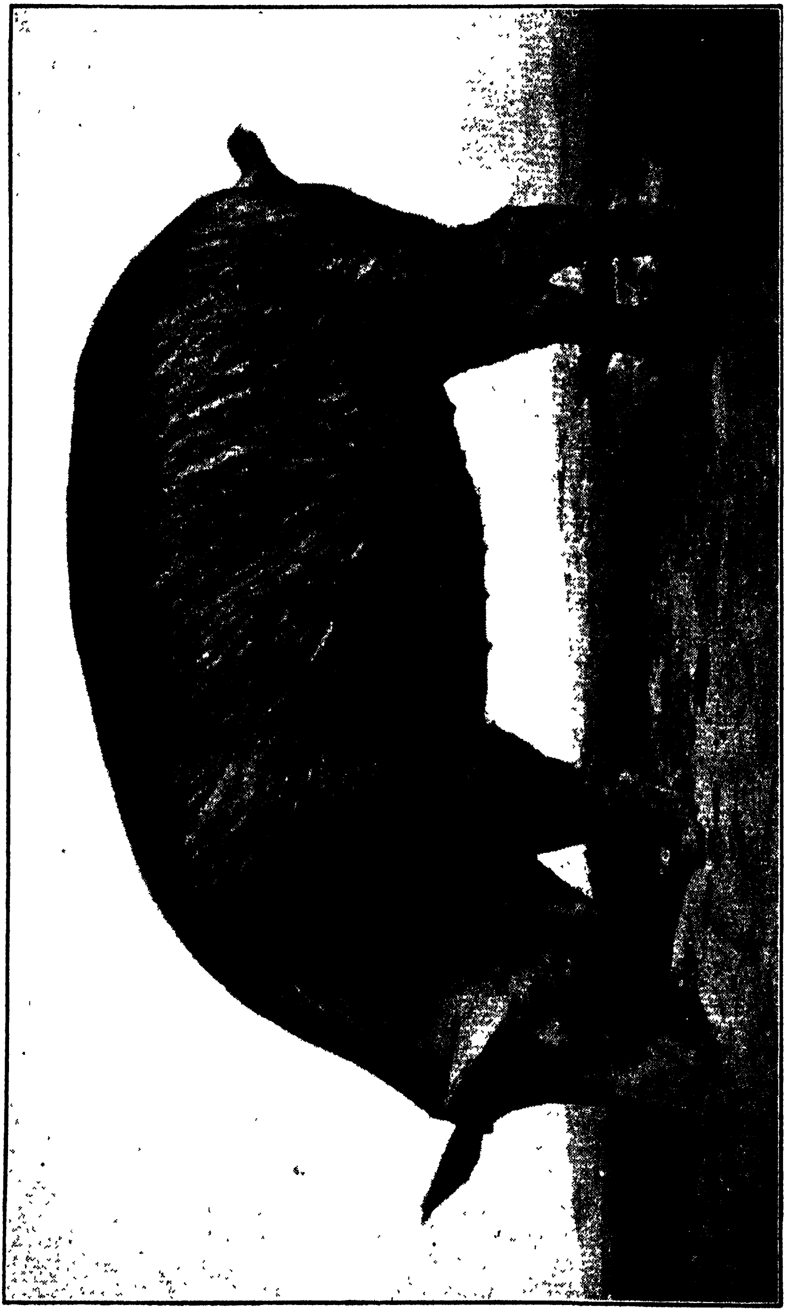
On an average it takes about 3 bags of barley and 50lbs. of meat meal to raise a pig to 120lbs. weight, the cost is approximately 18s. for grain and 6s. for meat meal. A weaner at 8 weeks is worth, say, 14s., *i.e.*, a pig will cost about 38s. to grow, taking grain at market rates.

The average price realised for a grown pig is about 50s., therefore, each pig will show about 12s. profit without taking labour into consideration.

An interesting point is that a truck load of pigs carried on the railway—130 miles—will cost about 3s. 3d. each for carriage, and the feed they eat would cost the same freight if carted the same distance.

These few calculations are based on actual feeding results, but by good husbandry and the use of as much by-products from the farm as possible, profits may be increased.

When finishing pigs off after they reach 18-20 weeks old, the use of the self-feeder must be discontinued. As the pig comes nearer maturity, the tendency to fatten is much greater, he becomes lazy and not having to exert himself to get full from a self-feeder, he fattens too easily. To overcome this, it is a good plan to feed the grain scattered about and make the pigs gather it in single grains, and then by working hard for less grain, the pigs grow more leggy and active, tending to reduce the fat.



A Young Tamworth Sow "Hawkesbury Trix" (Roseworthy Agricultural College).

SUMMARY.

1. Use only pigs for breeding of the long type, suitable for both local and overseas markets.

2. Use paddocks as much as possible, and make the paddocks comfortable for the animals with as much straw as possible.

3. Feed weaners separately from their mothers and feed heavily, remembering that a pig is only a converter of grain and waste products into meat, and time being the essence of the contract, get him sold as quickly as possible.

4. The most essential part of all is to cultivate the type of pig which sells best and this pig is only produced by watching the pigs and not feeding heavily shouldered and coarse pigs into bacon.

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Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

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EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

WHAT CAN WE DO TO AID THE DISTRIBUTION OF FRUIT IN OUR OWN STATE?

[R. A. CRAMMOND, Lenswood and Forest Range.]

[*Paper read at the 46th Congress of the Agricultural Bureau of South Australia.*]

These are some suggestions that I would put forward to increase the consumption of fruit in a good market at our own back doors, and for convenience the subject will be dealt with from three aspects:—

First, as growers, it is essential to grow fruit of the best quality, then grade it and put it up attractively.

Good fruit must be graded to look its best, and it will naturally tempt consumers to purchase more. Good fruit also needs a clean case, not the nondescript boxes that are often seen in the market.

It is suggested that all cases should be sold with the fruit, and again sold by the fruit distributor to licensed case dealers, who would thoroughly clean, fumigate, and renovate them. Growers could then repurchase them and use them again, less the percentage of cases that were unfit for use. By this means there would be no distribution of disease in secondhand cases; this is an aspect that many growers do not appear to take into consideration. To see fruit offered for sale in dirty cases is no inducement for consumers to purchase it.

It Pays to Advertise.

Secondly, fruit needs advertising; it is Nature's own food, and why is it not proclaimed from the house tops? It is a recognised fact in the medical profession that people who have plenty of fruit in their diet suffer less from degenerative diseases, and that fruit materially assists in cases of high blood pressure. The Education Department could be asked to assist in advertising the value of fruit by instructing teachers to give lessons at least once a month on the advantages of fruit in the daily diet.

A big percentage of fruit consumers are not aware when the different fruits are in season, nor do they know how best to purchase them. Possibly a list could be published in the daily paper advising consumers when to buy, and a few short notes on each variety of fruit, so that they could purchase when the fruit was at its best. From market experience, growers know that many retailers do not purchase fruit for resale until the consumers ask for it, therefore it is the duty of the producers to encourage them to do so.

Who will pay for this? This has always been a sore point, but all orchardists should pay an advertising fee, which could be reckoned on an acreage basis—1s. per acre would represent £1 for 20 acres, and while it would amount to very little per case of fruit produced, it would give the scheme a start. This fee could be collected by district councils, who have all the necessary data at their disposal. A board of growers could decide how the money should be spent.

This board of, say, seven growers, would be elected from seven divisions or districts, so that the majority of growers would be represented.

Thirdly, South Australia is an agricultural and horticultural State, and as growers would thereby be making a genuine effort to help themselves, perhaps the Government would assist by taking steps to reduce the cost of transport, for this is one of the biggest hindrances to better distribution.

Expert evidence should be taken as to the crippling effect on producers of motor taxation, &c. A reduction in this tax alone would put many people in work, as it has done in other countries, and so create more consumers. Transport and *cheap* transport is the crying need of this country, and producers who require better distribution of their products should ask for more equitable treatment. Several bad markets are experienced immediately after motor taxation is due, often resulting in a reduction of 6d. to 1s. a case on hundreds of cases of fruit.

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THE CARE OF FARM HARNESS.

[By Russel H. Eime (Blyth).]

[*Paper read at the 46th Congress of the Agricultural Bureau of South Australia.*]

This subject may not receive much attention from some farmers, who consider that so long as the harness remains intact and the horses pull the load everything is all right. However, a little care will mean a much longer life for harness, and will keep it better fitting by making the leather soft and pliable. Moreover, with good-fitting harness a horse will be able to work better.

Preserving Leather Harness.

The aims to keep in view when preserving are to have the leather soft and to provide a waterproof surface, the appearance naturally being enhanced. Not just any oil will do for dressing, because some oils are most injurious to leather. For the general harness, such as winkers, collars, dray saddles, spiders, back bands, and perhaps leather reins, use genuine neatsfoot oil, mixing with it a tin of fat black to every gallon of oil. Do not be misled and accept compound neatsfoot for the genuine article. Some farmers may object to the addition of fat black because of the black staining hands and clothing when handling, but this only happens for the first two or three days after oiling. The use of neatsfoot oil alone is not sufficient. It may have a preserving effect, but it does not waterproof the surface, and the preserving effect is lost without a surface.

Neatsfoot oil is naturally a thick oil, and in cold weather will not run out of the tin very easily, so that the mixing of fat black may seem difficult, but this is overcome by heating slightly. On no account must the oil be cooked. This mixture can be applied to the harness with a paint brush while it is warm, the oil soaking well into the leather. This method is better than using the mixture cold and rubbing it on with a cloth. All grit and dirt should be removed from the leather before any dressing is applied. One dressing of oil is not sufficient for the life of the harness. It should be oiled at least twice a year, and it is an ideal job for a wet day.

For dressing riding saddles, girths, and bridles use "Coacholene," following the directions on the tin. This preparation provides a waterproof surface, at the same time oiling the leather, and if applied properly will not come off on to the clothes. If so desired leather reins can be dressed with "Coacholene," because it does not leave a black stain. Folding girths should be packed with "Coacholene." It may be a little more expensive, but something good must be used to preserve the leather of a girth.

Storing the Harness.

All harness should be hung up on pegs in the stable or harness room. I prefer to hang the harness in the stable for convenience, but care must be taken to have the pegs high enough so that the horses will not knock down the harness, especially the collars and winkers, which, of course, would be hanging near the horse. The other harness should be on convenient pegs behind the mangers. Never allow pigeons to roost above the harness and soil it. All harness should be hung on the pegs, and not thrown from a distance of 10yds. or more.

Collars should never be stacked one against the other, on top of one another, or packed together on a rail. Provide a separate peg for each collar, and hang it with the lining outwards in order to give it a chance to dry. The hames may hang on the collar. A pair of winkers should also hang on the same peg as a collar, putting the winkers on last, otherwise the collar resting on the winkers will damage the eye flaps. The same damage will result if the winkers are packed together on one peg. Dray saddles should not be hung one on top of the other, because twisting and straining of the leather, or damage to the lining, may result. They should either be hung with the peg in the channel or hung over the peg by the crupper strap.

Leather spiders and back bands may present a problem. It may not be practicable to bring them home each evening and store them in a proper manner. If they are left in the paddock over night cover them with a few bags in order to prevent dew, frost, or an over-night shower of rain settling on them. When they are not in use from day to day they should certainly be hung up under cover. Riding saddles when not in use should be under cover, and hung on a thin peg, resting in the channel. Be careful not to give a hack an opportunity to roll with a saddle on its back. Many saddle trees are broken when horses are allowed to run in the stable yard while saddled.

Fitting the Harness.

The fitting of a collar may present a difficulty, especially if it is newly lined, when it will appear to sit up on the horse's neck. Such a collar will soon pull into the shape of the shoulder. If in doubt measure the neck with a ruler; place the hand on top of the horse's neck with the arm horizontal, and measure vertically until in line with the bottom of the throat, being careful not to measure around the curve of the neck. If the collar is to fit properly it should be the same. When buying a new collar measure the horse in the above manner, and you will not be in doubt as to the size of collar to purchase. The careful fitting of a collar is important, for if it is either too large or too small sore shoulders will

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result. A collar that is too small will pinch the top of the neck, and may also scald the throat. Providing the collar is the correct size it must also be buckled on correctly, fitting neatly around the neck. A sore on the inside of the shoulder tells that it is fitting too tightly. On the contrary if the sore is on the outer edge of the shoulder the collar should be buckled a little tighter. Although these precautions are taken sores may still appear. The lining of the collar may need attention. Do not wait until it is torn or rotted before having it repaired. If the lining is found to be hard and flat have a saddler reline it.

The careful adjustment of the hames will also help to prevent sore shoulders. The hames should fit neatly around the collar. The draught should be neither too high nor too low. Needless to say, the same collar and hames should always be used for the one horse, because it is rarely that two horses have shoulders shaped alike. Should horses be troubled with sore shoulders have the collars relined, and when fitting observe the facts mentioned above, and the trouble should be greatly minimised. Whether rubber-lined collars will prevent sore shoulders or not I am not prepared to say, but care must be exercised to see that they fit correctly. The sweat must be washed from the rubber lining every morning with a damp piece of cloth; also, when oiling the leather of the collar be careful not to let it get on the rubber, for it is well known that oil and rubber are great enemies.

Winkers may also cause sores to the head when incorrectly fitted. They must fit neatly and be tight enough to prevent the horse from getting them off if he rubs against the next horse, but do not have the bit straining in his mouth. The forehead strap should meet the head strap just beneath the ears; not so low as to rub on the cheekbone and cause a sore.

If the dray saddle or riding saddle gives a horse a sore back it should be relined, and it is advisable to use a saddlecloth with the saddle. It is easier on the horse and saves the lining of the saddle. Be careful in the adjustment of the girth of the riding saddle, especially the split girths. If the tension on all buckles is not the same the girth will pinch, and girth galls may be the result. To prevent any likelihood of this use a folding girth with a steel ring at each end and with straps sliding through it which buckle on to the saddle. With this type of girth the tension must be even although one strap may be higher than the other.

When using leather spiders and leading chains see that the spider rests on the horse's rump and not half way up the back. Adjustments can always be made. The belly band should be just behind the front legs, but not so far forward as to cause chafing. The spreader used with leading chains, and the swingletree with the abreast team, should be wide enough to prevent the chains squeezing the horse when pulling. The chains should never be twisted; if so they will chafe the animal's sides, and a horse with uncomfortable harness cannot be expected to do his best.

Repairing.

However much care is exercised with harness some breakages are inevitable. A box of copper rivets is at times very handy for effecting the necessary repairs. Do not use them on any tight-fitting harness such as girths and some parts of the winkers, which should be stitched. Suitable repairs can be made with copper rivets in the case of couplings, leather traces, spiders, breeching supports, and the loose-fitting parts of winkers. If the eye flaps of the winkers become bent out, a strip of thin leather riveted from each flap to the centre of the forehead strap will hold them in position. I would not advise a farmer to attempt the relining of any of his harness. That is a job for a tradesman; the shaping of the lining is important, and must be done correctly.

If farmers in their own interests will treat their harness in the manner outlined above it will last almost indefinitely, and horses will do their best because they are fitted with comfortable harness.

STATE OF SOUTH AUSTRALIA.

VARIETIES OF WHEAT SOWN, SEASON 1934-35.

[A. W. Bowden, Government Statist.]

The Acting Government Statist reports that 183 (186) varieties of wheat were sown for the wheat crop of the season 1934-35. The total acreage sown for grain, hay, and fodder was 3,459,380 (4,074,417), of which the varieties were not specified for 106,676 (102,941) acres.

Particulars of the 16 most popular varieties are given at foot hereof. Nabawa occupies first position for the fourth year in succession, but its proportion to the total sown is lower than previously. Ranee (a good flour wheat) and Gallipoli retain second and third positions respectively, with Ranee showing an improved percentage and Gallipoli receding slightly. Sword has made a decided advance, rising from eighth to fourth place, with a corresponding improvement in percentage. Of the remaining leading varieties, Waratah, Ghurka, and Dan show slight advancement in ranking and percentage, while Gluyas, Ford, Late Gluyas, Currawa, Federation, and Sultan have all dropped back slightly.

The leading varieties favoured in each of the divisions and their percentages to the total were:—

Central.—Sword, 18; Nabawa, 17; Ranee, 11; Ford, 9; Waratah, 8; Gallipoli, 4.

Lower North.—Ranee, 17; Nabawa, 16; Sword, 14; Ford, 9; Waratah, 7; Gallipoli, 7.

Upper North.—Ranee, 40; Nabawa, 19; Federation, 8; Gallipoli, 5; Waratah, 4; Gluyas, 4.

South-East.—Gallipoli, 40; Ranee, 10; Ghurka, 9; Ford, 8; Sword, 4; Nabawa, 3.

Western.—Nabawa, 26; Gluyas, 13; Late Gluyas, 11; Waratah, 10; Ford, 6; Ranee, 5.

Murray Valley.—Gallipoli, 22; Nabawa, 20; Ranee, 15; Gluyas, 6; Waratah, 3; Silver Baart, 3.

Sixteen Leading Varieties of Wheat Sown, 1934-35 *and* 1933-34.

Kind of Wheat.	Total Area Sown for Grain, Hay, &c.		Percentage to Total.		Relative Position.	
	1934-35.	1933-34.	1934-35.	1933-34.	1934-35.	1933-34.
Nabawa	682,464	915,520	19·73	22·47	1	1
Ranee	495,175	432,771	14·31	10·62	2	2
Gallipoli	295,503	398,496	8·54	9·78	3	3
Sword	277,715	105,494	8·03	2·59	4	8
Waratah	241,559	251,450	6·98	6·17	5	6
Gluyas	219,069	385,311	6·33	9·46	6	4
Ford	214,317	264,970	6·20	6·50	7	5
Late Gluyas	125,936	170,966	3·64	4·20	8	7
Ghurka	68,232	40,107	1·97	0·98	9	16
Currawa	57,370	100,056	1·65	2·46	10	9
Dan	57,350	58,157	1·65	1·43	11	13
Federation	48,401	94,872	1·40	2·33	12	10
Sultan	47,765	66,417	1·38	1·63	13	11
Aussie	45,835	52,653	1·33	1·29	14	14
Merridin	41,109	28,277	1·19	0·69	15	21
Felix	39,606	60,053	1·15	1·47	16	12
Other and unspecified	501,974	648,847	14·52	15·93	—	—
	3,459,380	4,074,417	100·00	100·00	—	—

In commenting on the above, Mr. R. C. Scott, Supervisor of Experimental Work in the Department of Agriculture, states:—"The committee for the improvement of the standard of wheat in South Australia suggested that three of the above varieties, viz., Gallipoli, Waratah, and Ghurka, should, wherever possible, be eliminated from the wheats planted in South Australia on account of their low milling qualities, which is depreciating the value of our wheat overseas."

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow March to August.	Per Herd during August.	Per Cow during August.	Per Cow March to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
A	28	23·81	15,790½	563·36	2,406·06	843·63	30·09	124·95	5·30
/C	14·03	10·77	7,805	556·30	2,625·27	348·17	24·82	111·54	4·46
/D	29·42	23·68	10,551½	358·65	2,553·91	643·12	21·86	141·19	6·09
/E	13·97	5·87	3,875½	277·41	2,312·15	193·37	13·84	112·85	4·99
/F	17·48	15·81	10,252½	586·53	2,586·48	467·61	26·75	114·81	4·56
/G	24·87	14·94	12,401	489·63	2,528·17	627·74	24·76	131·14	5·06
/I	28·48	23·55	17,379½	610·23	2,384·32	737·97	25·91	103·36	4·25
/J	18·29	16·13	12,013½	656·83	2,323·81	526·24	28·77	99·91	4·38
/L	27·48	21·74	12,488½	453·79	2,076·30	513·18	18·63	84·70	4·10
/O	28·61	18·10	12,185½	425·91	2,338·69	559·61	19·56	110·26	4·59
/P	44·48	41·68	25,308	568·97	2,270·70	1,295·00	29·11	115·41	5·12
/Z	11·90	10·81	4,093½	343·99	1,803·91	190·84	16·04	87·27	4·66
/W	28·71	20·77	18,999½	661·77	3,402·71	745·82	25·98	144·90	3·93
/X	9	7·58	4,429	492·11	2,282·56	218·64	24·29	117·15	4·94
/Y	10·29	9·29	5,887½	572·15	2,611·67	247·03	24·01	106·08	4·20
/T	15·16	7·39	5,719	377·24	1,925·07	285·44	18·83	88·75	4·99
/Aa	15·16	14·29	8,735	576·18	2,567·60	454·44	29·98	142·29	5·20
/Bb	24·06	16·52	9,909	405·85	1,677·19	492·63	20·75	87·47	5·14
/Cc	18	17	11,361½	631·19	2,933·15	589·30	32·74	152·17	5·19
/Ff	19	13·97	6,621	348·47	900·66	248·29	13·07	33·23	3·75
Ee	43	31·77	12,541	291·65	1,260·29	578·27	13·45	64·05	4·61
/Dd	17	12·90	4,424	260·23	1,127·59	219·46	12·91	57·47	4·96
Means	22·11	17·24	10,584·59	478·75	2,280·57	501·17	22·67	110·34	4·73

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow October to August.	Per Herd during August.	Per Cow during August.	Per Cow October to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C	36	36	29,450	818·05	5,845·14	1,569·29	43·59	306·84	5·33
5/D	32	29·26	20,901	653·17	5,054·06	1,106·86	34·59	270·81	5·30
5/E	34	25·35	15,921½	476·21	5,160·51	830·59	24·87	267·55	5·24
5/R	70·48	63·77	48,475	687·87	4,927·57	2,211·20	31·38	221·40	4·56
5/Ee	20·77	13·74	11,774	566·87	4,608·23	557·75	26·85	233·34	4·74
5/Z	29·65	27·39	25,782	869·54	8,190·41	1,302·24	46·96	423·66	5·40
5/Ww	20	17	13,144	657·20	5,212·05	612·77	30·64	245·19	4·66
5/Xx	19·90	18·94	12,693	637·84	4,858·35	636·71	32·00	252·00	5·02
5/Yy	11	10·19	6,773½	615·77	4,636·69	340·78	30·98	235·28	5·03
5/Aaa	19	16·55	12,006	631·89	5,138·55	617·53	32·50	254·51	5·14
5/Bbb	17·29	12·74	7,899	456·85	3,562·21	393·32	22·75	178·85	4·98
5/Ddd	28	25·68	26,538½	947·80	8,414·11	1,153·57	41·20	350·07	4·35
5/Eee	26	22·35	14,870	571·92	6,796·34	685·73	26·37	306·53	4·61
5/Fff	8·65	5·71	4,715	545·08	3,586·86	191·96	22·19	162·94	4·07
5/Ggg	9	4·74	2,369½	263·28	4,570·33	106·46	11·83	214·34	4·49
5/Hhh	18	13·10	9,348½	519·36	6,020·40	387·51	21·53	244·10	4·15
5/Iii	17	11·61	4,748	279·29	1,934·41	254·25	14·96	112·15	5·35
5/Jjj	26·29	26·29	20,528½	780·85	8,635·61	1,156·20	43·98	193·53	5·63
5/Kkk	20·19	19·03	8,650	428·43	2,351·62	402·06	19·91	107·94	4·65
5/Aa	21	18	10,726	510·76	2,150·92	446·35	21·25	96·38	4·16
5/Lll	10	10	8,447½	844·75	—	397·21	39·72	—	4·70
Means	23·53	20·35	1,503·62	638·91	5,572·99	735·73	31·26	270·13	4·89

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow December to August.	Per Herd during August.	Per Cow during August.	Per Cow December to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	17	16·35	15,295½	899·73	4,048·25	742·05	43·65	200·88	4·85
6/C ..	21·61	15·65	17,320½	804·20	4,381·51	710·60	33·02	187·96	4·08
6/Y	13	6·55	2,666½	205·11	3,111·92	111·49	8·58	131·43	4·18
6/Ff .	28·48	19·16	12,937	454·24	5,030·14	556·97	19·56	211·42	4·31
6/Kk	18	14·58	6,587½	365·97	3,894·52	315·12	17·51	154·70	4·78
6/Ll .	23	13·23	6,932	301·39	3,755·49	255·81	11·12	140·09	3·69
6/Oo .	26·19	18·90	12,920	493·32	5,168·35	560·61	21·41	223·06	4·34
6/Ss .	19	15·19	13,692	720·63	6,616·76	492·37	25·91	256·16	3·60
6/Tt .	24	17·42	13,530½	563·77	5,555·42	575·11	23·96	234·89	4·25
6/Vv .	30	27·87	21,919½	730·65	6,120·39	1,022·34	34·08	286·70	4·66
6/Xx	27	21·55	13,470½	498·91	5,528·62	574·06	21·26	225·35	4·26
6/Cco	25	14·10	8,637	345·48	3,529·41	356·49	14·26	155·26	4·13
6/Ddd	24·68	13·26	10,385	420·78	4,316·08	405·19	16·42	189·22	3·90
6/Jjj	24·58	18·71	14,139½	575·24	5,659·06	656·93	26·73	269·49	4·65
6/Mmm	7·58	7·58	5,073½	669·32	6,126·62	249·69	32·94	277·84	4·92
6/Nnn	35·45	22·85	15,600	440·06	4,704·55	663·67	18·72	206·54	4·25
6/Ooo	25·19	22·81	19,468	772·84	2,917·34	848·21	33·67	122·77	4·36
6/Ppp	20·29	19·13	18,254	893·44	2,810·41	736·06	36·03	114·79	4·03
6/Qqq	16	13·77	16,532	1,033·24	2,263·15	652·63	40·79	85·83	3·95
Means	21·42	16·75	12,913·71	575·90	5,013·23	551·86	24·61	215·25	4·27

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow July to August.	Per Herd during August.	Per Cow during August.	Per Cow July to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	9	8·45	5,301½	589·06	1,120·56	270·12	30·01	58·07	5·09
7/P ..	29·19	24·94	17,846½	611·39	1,131·11	858·59	29·41	55·44	4·81
7/Tt .	17	15·35	11,753½	691·38	1,324·03	512·25	30·13	57·71	4·36
7/Bbb	82·19	63·71	42,325	514·96	1,015·47	1,937·79	23·58	46·09	4·58
7/Ddd	12	11·42	9,390½	782·54	1,525·83	448·69	37·39	72·02	4·78
7/Eee	13·71	12·29	8,085	589·71	1,215·13	419·66	30·61	61·52	5·19
7/Ggg	13	8·48	4,049	311·46	712·07	211·45	16·27	35·18	5·22
7/Hhh	12	8·39	1,720½	143·37	364·99	56·56	4·71	12·77	3·29
7/Iii .	18·84	6·03	5,748½	305·12	674·65	201·95	10·72	23·83	3·51
7/Kkk	25	19·13	13,767½	550·70	965·47	645·10	25·80	46·80	4·69
7/Mmm	12	9·45	5,621	468·41	928·53	295·99	24·67	50·73	5·27
7/Nnn	16	13·39	10,437	652·31	1,350·74	445·80	27·86	58·86	4·27
7/Ooo	21	16·84	8,891½	423·40	882·09	396·16	18·86	39·13	4·46
7/Ppp	18·68	18·48	9,809½	525·13	1,037·45	463·31	24·80	51·38	4·72
7/Qqq	20	17·19	13,764½	688·23	1,278·71	623·01	31·15	59·17	4·53
7/Rrr	20·13	15·10	10,799	536·45	874·99	480·69	23·88	38·22	4·45
7/Sss	10	8·19	7,140½	714·05	1,342·26	308·81	30·88	58·64	4·32
7/Ttt	8	7·87	5,282½	660·31	1,243·49	220·53	27·57	52·60	4·17
7/Uuu	22	17·23	10,529	478·59	—	436·15	19·83	—	4·14
7/Vvv	19·84	15·29	10,857	547·23	—	477·86	24·09	—	4·40
Means	19·98	15·61	1,065·60	533·36	1,039·31	485·52	24·30	47·73	4·56

PAPERS READ AT CONFERENCES.

SOUTHERN BRANCHES, MOUNT COMPASS, 15th AUGUST, 1935.

MAKING THE MOST FROM A SMALL HOLDING.

[W. F. ROADS, Inman Valley.]

At the present time it is difficult to be sure which line of business to practise on a small holding, say, up to 120 acres. Dairying has always been recognised as the best line to follow on a limited acreage, but in the last few years the ewe and lamb, given the same feeding of meadow hay and rotational grazing and attention to keep the ewes on an even line of feed all the year round, has in this district resulted in several instances in three and four lambing ewes being averaged per acre, and the prices realised for wool and lambs have seriously challenged dairying on any land, intense culture or otherwise. One person can easily look after the sheep, as against about three persons to attend to cows and pigs, etc.

The Jersey cow, with its ability to produce butterfat over a long period, and being economical to feed and rear up to producing age, and to keep up production to a big age with a minimum of failures, will go close to making a small holding a good line of business. Providing one could be assured of 10d. to 1s. all the year round, with the land laid down to good pastures and fodders and heavily topdressed (3cwts. if possible), a well managed dairy farm would "check up" pretty well, what with the sale of surplus stock and a fair supply of bacon pigs to place on the market at intervals.

Whatever line of production is decided upon, the conservation of a large amount of fodder and topdressing is the only way to be sure of success. To get the most from the land the bulk of the food supply, if not the whole of it, must be grown on the property. In this district some dairymen stake too much on clover hay as a sole ration for milking cows. It is a grand fodder, but in the winter months cows that are heavy producers begin to lose flesh, and later on fall away in production. To overcome this, a few acres of oaten hay will do wonders to keep up body fat, and so obviate purchasing grain. A good practice is to break up a pasture that is getting "sick," crop it for two years, and lay it down again and continue on the same lines with another paddock.

A good stack of silage will save the bran bill every year. A good stack of meadow hay and another of oaten hay, with a paddock of maize, another of Japanese millet or Sudan grass, plus good pastures, will keep a cow up to a good production right through, and nothing need be purchased outside at all. If concentrates of any kind have to be purchased, unless the herd is of a very high standard the cows will not give a good return above costs of production.

As regards pigs on the holding, there is no feed to approach skim milk for quick growth from suckers and right up to the finish off for sale. Three good sows will about keep up the supply of pigs, and 1 acre of mangolds and a patch of chou moellier will three parts keep three sows and a boar all the year round. A mistake with sows is often made by giving them too much feed when dry, thus causing poor litters to be produced later on. As many potatoes as can be grown in conjunction with other work should be planted every year, as they will prove a fair source of revenue in the long run.

I strongly advocate as much subdivision as possible, and to arrange for water in most paddocks. After the clover has dried off and the cattle have given the land a fair clean up, purchase a line of store lambs and put them on to clean up all top seed, etc. The seed would otherwise be wasted, the land is left in first class condition for an opening rain, and a line of fat lambs will have been produced.

To sum up in brief:—

Test all cows and keep only the very best and youngest of these, with a few choice heifers coming on later, and replace the outed cows with a certain number of ewes for export lamb breeding. Keep about three or four sows and a boar of the right type for baconers.

Topdress to the limit of your finances.

Store both meadow hay and silage, which will feed sheep or cattle.

Do not forget a paddock of oaten hay for early green feed and later for good hay. Grow several kinds of summer fodders to follow on in rotation, also a plot of potatoes if possible.

By keeping a good herd of young cows on hand it will be possible to change to dairying should the industry come into its own again.

EXPERIENCES OF SCRUB CLEARING AT MOUNT COMPASS.

[J. H. SNEYD, Mount Compass.]

In giving one's experience of scrub clearing, it is difficult to make it of general interest, because so many of the practices adopted with success on your own property are not applicable to even the next door neighbour.

My property consists of 800 acres of undulating ground, carrying low stringybark scrub, with a percentage of good flats, green in summer. Taken over six years ago, the property was all scrub, unfenced other than the boundary. It carried no stock. To day 600 acres are cleared and carry 700 sheep and 40 head of cattle, with every prospect of turning off 500 lambs this year.

The method of clearing has been the same over the whole area, *i.e.*, rolled in summer, the scrub left lying as long as possible, burnt in April, and ploughed in the autumn and early winter, left fallow until the following February, ploughed again, harrowed down, then seeded with a hoe-drill with light harrows behind. The implement that has been used for ploughing has been a Sundercut, set over as far as possible, so that it would pull out the maximum number of stumps. It is interesting to note that the majority of landholders who a few years ago were trying to establish pasture without ploughing have now reverted to the former method. The mixture sown on the average has been 2½lbs. Subterranean Clover, 1lb. Cluster Clover, and different combinations of grasses.

One of my earliest mistakes was in sowing grasses and clovers unsuitable for this district, *e.g.*, Sheep's Burnet, Alsike Clover on high ground, Commercial Perennial Rye Grass, lucerne; and on raw ground, Cocksfoot. These do not give results commensurate with their cost. Some of the most useful grasses and clovers are *Lotus Major*, which gives exceptional results in wet boggy places. Paspalum is well worth seeding on either high or low ground. Kikuyu is worth considering, and responds wonderfully to a dressing of cow manure.

Clustered Clover is a splendid clover, and for sowing on ironstone rises is preferred to Subterranean Clover, as it is far hardier, gives a good bulk of feed the first year, and improves the ground, so that eventually Subterranean Clover can be introduced with success; 1lb. per acre is a good seeding. Good results have been obtained with ½lb. per acre.

Fog Grass: Everyone knows of this, and for either high or low ground it is hard to beat. Chicory gives quite good results. *Phalaris* is not worth bothering about for a few years; it is hard to establish. For sowing an area of new ground I recommend 5lbs. of Subterranean Clover, 1lb. Clustered Clover, and 4lbs. Fog Grass. This mixture was sown with only 2½lbs. Subterranean Clover, together with a cover crop of Algerian Oats on 200 acres of ground that had been fallowed for 18 months and had the best results I have ever had. There is no doubt fallowing pays—the longer it is left turned over, within reason, the better.

None of the foregoing grasses and clovers do well without superphosphate. The first year use 2cwts. per acre; in fact, 3cwts. would not be wasted. The second year 1 bag per acre, and after that as much as can be afforded. In applying the superphosphate use the box-type spreader. It is slower, but makes a far more even job than the spinner. Graze lightly the first year to give the pasture a chance to seed itself.

It is surprising the opinion that many people living outside this district have of Mount Compass. Many believe it all hungry white sand, suitable only for kangaroos. Results already obtained in this district should alter their opinion. It is often said in reference to this dstrict that one wants a small fortune to do any good. It is peculiar that there have been instances here of men with practically unlimited capital who have not made a success of their properties, whereas some of the best properties are owned by men who have started with nothing and have had to make money off their properties before they could spend it.

On the remaining 200 acres of scrub 160 wethers are grazed, changing them in and out of the scrub on to the grass. Although the wethers are by no means fat, they are in good strong condition, and they cut light fleeces of very attractive wool. Last year it was sold for 15½d. a lb. These wethers give some return from the scrub land. The value of the scrub as roughage for stock cannot be overestimated.

The grubber plays an all-important part in clearing scrub in this district, because no matter how well the land is cultivated, you always have Yacca and Titree to grub afterwards, as well as shoots to knock off. Another point to consider is the provision of hay paddocks. These are absolutely necessary, and the sooner one grubs an area in proportion to the size of the farm, the better.

In conclusion, I would like to comment on the wonderful way in which the older established settlers in Mount Compass go out of their way to assist any new comer who goes to them for advice. Things are pointed out at once, which have taken them years of experience to find out, and it must have saved many new settlers many pounds besides preventing them from starting out on wrong lines.

SUGGESTIONS FOR GREATER CONTROL OF NOXIOUS WEEDS.

[F. C. Keen, Port Elliot.]

The time is long overdue when more serious attention should be given by all Governments to staying the spread of noxious weeds. The Agricultural Journals and Gazettes, as well as the leading daily papers of nearly all States, have given much space to the consideration of this serious question, yet the weeds continue to spread. The latest effort of the New South Wales Government is to offer a large sum of money to the person or persons who can find a practical method of destroying Skeleton Weed, that has threatened ruin to some of the best agricultural land.

In all States many of the older settled parts have one or more useless weeds. If greater precautions are not taken by settlers in new country, weeds will surely find their way into every settled part. The agents for distributions are so many, and stock are moved so quickly and such long distances, that it is a simple matter for a new district to be invaded. Skeleton Weed was not taken much notice of on its first appearance in New South Wales. To-day it is an enemy proving to be a great misfortune to agriculturists.

For new districts the matter of importance is that these weeds be recognised early and destroyed or reported. If children knew more about weeds they could help in the reporting or destruction of these enemies. Even in the city, the park lands and vacant allotments would not grow any new noxious weeds if school children were taught the importance of recognising or destroying useless and dangerous plants. For many years the Agricultural Departments of the various States—through their Journals—have illustrated many of the weeds and methods of destruction. This information could be made still further use of, if the State Agricultural Departments pooled all the illustrations in their possession with the information regarding same. This matter is of sufficient importance for the Commonwealth Government to be asked to bear the expense of compiling a "Noxious Weed Reference Book" suitable to all schools in the Commonwealth, and it would help boys and girls to grow up in a knowledge of the inconvenience and danger that can be caused by allowing noxious weeds to go unnoticed.

These weeds spread slowly but surely. The great aim should be, first to stop the spread of the weeds already established in older districts, to new areas, and secondly, to keep watch for suspicious plants, and not to allow new varieties to get a hold. Children can be helping agents in the war on noxious weeds. Why not let them help? They also will reap the benefit. This matter is of sufficient importance to ask the Advisory Board to request the combined Governments of the Commonwealth to unite in an endeavour to publish a "Noxious Weed Reference Book" for the use of the Education Departments of all States of the Commonwealth.

HOW TO MAKE FARMING PAY.

[H. A. ECKERT, jun., Belvidere.]

Anyone with free land and a useful banking account, say £100, may hope, even with these continuous bad times, to keep his head above water, but to those who are unfortunate enough to be handicapped with big mortgages, low rainfall and long-distance freight, their best plan would be to give up farming.

Coming back to conditions in the Belvidere district, which includes handy markets and shorter freight, a useful if patchy rainfall, and fairly good country, it may perhaps be possible to profitably pursue a system of mixed farming. Undoubtedly there are several farmers who, with a useful inheritance and great physical and brain capacity, are more than holding their own. More are stationary and probably some are slipping back.

Looking at the world's position at present and for some years past, it seems that farmers must give that great industry that they have always so much looked upon as a hobby and livelihood, namely, "wheat growing," considerably less thought than before. The lamentable price is no inducement for them to continue. Growers have held on with much hope for so long that at last they must admit that with the utmost economy and best production they cannot even possibly hope to make it pay. Therefore they must turn their attentions elsewhere.

Australia's world-wide reputation for wool and more latterly for lambs will naturally turn attention to sheep. Their returns are more continuous, the expenditure less, and the labour more congenial. However, care must be taken to restrict outputs to something like world requirements. Cows are a standby that is at times very useful, if not altogether payable. In conjunction with pigs they are worth some consideration, and no farm would be complete without a flock of fowls, from which farmers should strive to have enough to pay the grocery bill.

To turn attention more to stock will require more attention being paid to pastures and fodder. In trying to detect the best farmers' methods, one finds without exception that they have good stacks of hay. Always, even in drought times, they have more than ample for their own requirements, and are never afraid to cut those acres of their crops that would produce the golden grain. Hay is a wonderful standby, and ensilage—although so frequently given prominence—appears to be rather beyond local conditions. It has never been practised with anyone in this district with success. However, oats and other grains can be stored cheaply and effectively for tiding the stock over the dry and troublesome April to July period.

The later practice of sowing fodder for stock has met with general success, if sown early on light soil, for the first and most useful picking, and a crop sown on the firmer soils, which will continue to thrive in the winter months, will be equally effective. A little barley sown early on light soil will give good results; the same applies to oats. However, taking the whole of the winter and spring period into consideration, oats are easily the best. From the cereal crops farmers must try to get the best results from stubble with more oats and barley. Stubble feed may quite truthfully be said to be worth double.

A crop of peas makes wonderful feed for all classes of stock, and will provide a good field for early greenstuff to follow on; it will improve pasture land with less expense and more benefit than any other crop, and in the event of a revival of wheat prices, the land would be almost equal to fallow. Particularly is the pea crop valuable for enhancing stock-carrying capacity. Peas are easily and cheaply grown. Land ploughed in June and sown with 60lbs. or 70lbs. of super., together with 70lbs. of seed, will return a big growth of straw, which if not reaped for grain will make excellent feed if raked into rows before the straw is discoloured. The latter is one of the chief faults with peas; the straw generally discolours when the grain ripens, and it is imperative that they be raked into rows, preferably in the morning before the straw is too brittle. They will be ready to stack immediately, if anyone has the time and sufficient labour.

One of the chief objects, if farming is to pay, is to utilise every minute to the best advantage; try to do any work in what is called slack time, and so save time in the busier periods of the year.

Much can be accomplished in this way in the destruction of rabbits and noxious weeds. Overhaul machinery, wells, and windmills and erect feeding conveniences for stock, fences, &c., all of which will dissipate valuable time if it has to be contended with during seeding or harvest. There are many valuable points to be learnt about stock on farms, many of which will only come by hard experience. The first necessity is to find out what stock can be kept comfortably. Overstocking is a burden, and understocking a waste. Breeding one's own stock pays best. Even if a certain class of stock becomes unprofitable, it is always advisable to keep enough on hand to breed back should the market take a turn for the better. By having the farm rather understocked, one may be able, with a little judgment, to turn over almost any class of stock at a profit, but by not having sufficient feed one would have to be down to the same basis as a dealer and rely solely on brain work and judgment.

It is impossible to make farming pay without wide experience, efficient plant, effective marketing, funds to work on and 12 hours each day of hard and brainy work, and living with the strictest economy.

TREES FOR SHELTER AND TIMBER FOR INMAN VALLEY AND WAITPINGA.

[J. W. CROMPTON, Port Elliot.]

In these districts there is a very large proportion of land that will not grow more than a limited variety of plants. The cause of this is mainly the tightly packed glacial clay or the proximity of solid rock to the surface, which latter is usually a less limiting cause.

Shelter from plants seems always to be preferred to artificial shelter by stock. Trees as a rule do not make such good shelter in cold weather as hedges. Any farm animal will get under the lee of a hedge that is dense to the ground and high enough, in preference to a tree that is not dense to the ground. The ordinary tree only reduces the force of the wind some distance to leeward; there is draught under trees. Therefore a patch or belt of trees with a hedge to windward has a greater shelter value than trees dotted about, both in cold and hot weather.

Moreover, trees so much reduce pasture growth and crops that it 's advisable to have patches of trees and full areas of absolute clearing. A flock of sheep will often crowd into the shade of one tree, although there is another tree 100 yards away. If there is a patch of trees the flock spreads in comfort in hot days, and in cold weather they will get more shelter near the lee side of a patch and more still near a hedge.

If protected, Budlea and Wormwood make very good hedges. Both are frostproof. Wormwood seems capable of growing on almost any soil, but it prefers sand. Budlea, however, prefers loose soil. Where subsoil and climate are suitable, it only needs protection for about 10 years. After that it would stop a bull, and its height and overhang make it ideal

Bamboos are very good and make a useful growth almost anywhere. The ordinary White Spanish bamboo grows well on alluvial soil and the Variegated grows more dense than the White on sandy slopes. It is denser down low, but not so tall. Bamboos, however, need permanent protection, and they have a food value. A belt of native scrub with Yaccas will supply a very good shelter in both cold and hot weather. As a rule, ewes and lambs avoid it for fear of foxes, and like other hedge plants, the animals will ultimately kill all undergrowth.

THE PINES.

Of the evergreen imported trees suitable for cold and wet weather the pines seem to be easily the best, though olives might be tried Olives must be protected; they are slower to grow, and only limey soils are suitable. I have tried Canary, Aleppo, and Maritime, but the *Insignis* is perhaps the best of all. The Maritime is a little slow at first, but very hardy. The Canary Pine is a handsome tree and long liver. It grows very slowly for many years and does not spread.

The Aleppo is common to almost the whole of the State. It needs a warm climate and a deep moist subsoil, and under these conditions it is a beautiful long-lived tree. It is a better timber tree, and better for firewood than *Insignis* or Maritime

The Cypress is similar to the Aleppo as timber and lives long. It has dense foliage, but grows slowly.

Insignis and Maritime timbers are very much alike and are useful for butter and fruit boxes and where a non-splitting wood is wanted. They both have a tendency to shrink and lack the ability to stand weather. Canary Island pine produces an extra strong and good timber. It is even stronger than Oregon.

Another evergreen that is especially suited to saline sand is the *Lagunaria*. It grows well on the coast. The Norfolk Island Pine has an attractive appearance, but is not suitable for shade when young. These pines need a lot of care and water for the first few years.

Deciduous trees are not necessarily the best shade trees, but they allow the sun to filter through when warmth is wanted and are very suitable for planting on the eastern or south-eastern side of sheds and yards.

There is a very large variety of these that suit alluvial soil, but there are few that will do on a tight subsoil. For bad subsoil the pear will often grow to a big size and provide good shade. Select a strong growing variety and plant the graft joint well below soil level. If on the farm there is a patch of wet land and the water is not required the risk of sheep-worms and fluke will be reduced if it is drained. Establish a pear tree on that spot and it will be dry for most of the summer. If the wet patch is too large for a pear tree a patch of Cork Elms might be excellent. Do not plant these trees near a garden, but only where animals can keep the suckers under control.

English Elms would do instead, but they are not so hardy and neither will they stand heavy sea winds. Weeping willows will make good growth if the wind is well broken. Those three are all fodder trees.

The Elms are mentioned as suckering, but this can be greatly reduced by growing them from cuttings that have had all buds below the soil carefully cut off before planting. Elms should be planted in the corners of yards, especially sheepyards. They make a remarkably dense shade even when very young, the timber is a tough non-splitting useful wood, and the tree lives for hundreds of years.

In very many cases the native tree that originally grew in that exact locality is the best tree to plant or to keep. The best of the local trees for this is the Bluegum, but Scrub Stringy has grown from a seedling to 1ft. in diameter in 20 years.

[Papers Read at Conferences.]

HILLS BRANCHES, LENSWOOD, 22nd AUGUST, 1935.

ESTABLISHING A DAIRY FARM IN THE HILLS DISTRICT AND SOME OF THE COSTS PERTAINING THERETO.

[J. C. BLAKELY, Cherry Gardens.]

Much of the land in the Hills Districts in its natural state carries heavy Blue Gums on one slope, heavy Stringy Bark on the other elevation, with big Red Gums on the lower slopes and flats, and with no scrub. This land does not produce a milk producing fodder even during the best seasons of the year but it provides a hard, fibrous roughage, which is beneficial to stock that have access to succulent feed such as clover, rye, *Phalaris tuberosa*, Kikuyu grass or ensilage.

The Blue Gum land is hard on the surface with the clay not far below, and with a percentage of small iron-stone quartz. The Stringy Bark ground has a decided advantage over the Blue Gum. The surface is looser with a fair thickness of mulch, no doubt brought about by the more fibrous and softer nature of the bark, which during centuries has allowed it to decay and form a very valuable depth of surface mulch. This surface mulch is essential to the establishment of Subterranean Clover, which should always be the pioneer crop in any pasture establishment, owing to its ability to enrich the soil with nitrogen. The nitrogen content of virgin Stringy Bark land is not altogether negligible as it is in Blue Gum, owing to the mulch containing what is known as scrub or organic nitrogen.

The most economical way to clear the land is with a 25-ton monkey grubber costing £34, pulling the trees over. Arrange with a reliable wood carter with a large lorry, and give him the wood. Draw up a contract for the wood to be cut and neatly stacked and carted from the property within a given time; the carter to put up a cash deposit, the deposit and any wood remaining over the stated period to be forfeited by him and retained by the land-owner for non-fulfilment of the terms of the agreement. Do not cart the wood yourself. A holding cannot be developed while carting with a small lorry.

The removal of the stumps and the filling in of the holes will entail a fair amount of time and labour. The burning of the stumps and tops should be done with care so that no great heat will be created on any one spot; having this point in view the stumps must be sleighed to one spot for burning, preferably some hole or hollow such as an old saw pit.

Two good horses each costing £15 will be required. The ground is now ready for the spring tooth cultivator, costing £6. The cultivator should be put down to work the ground crossways to a depth of 2in., the cultivating being done as early as possible to enable sowing early in May, applying 2cwts. of super and 10lbs. of Subterranean Clover per acre. This should be lightly harrowed with the back of the harrows only. The above method is essential with Blue Gum ground, whereas it is possible on Stringy Bark ground with a good surface mulch to establish clover without cultivation.

In the second year, apply 1¾cwts. super per acre, third year 1½cwts., and 1cwt. super per year thereafter. The cost of super and seed for the first three years will be 25s. per acre.

Six lambing ewes were carried per acre for five months on one plot. It is in its fourth year, and the nitrogen content of the soil is now sufficient for further progress in the pasture scheme; that is; the introduction of Perennial Rye and *Phalaris tuberosa*. A good way to tell if the clover paddock is ready for rye is by the growth of Soft Brome, &c.

Purchase stock when feed is available and the increase of feed must be there before the herd or flock is added to. Do not look upon the feed in the spring or flush of the season and measure the herd by it, or they will fail during the lean months. There is only one way to economically handle the pasture and that is to feed closely while in its early growth, closing certain paddocks off early in September for hay and ensilage.

A mowing machine costing about £30 will be required. The handling of a good clover growth has often been spoilt in curing. The general opinion is not to put it in the stack too green, but this is a fallacy. Do not put it in the stack wet. The hay maker should realise that it is the leaf of the clover which contains the highest percentage of protein, and that is what the dairy cow requires. A hay shed and a 10 cow milking shed is necessary and will cost £60. Chaffed Meadow Hay provides a more balanced or staple diet during winter and early spring, when the grazing is watery and over succulent. Early winter growths of green feed can be had, by sowing with the first rains on fallow, cereal rye, Cape Barley, wheat, and oats.

A good haystack is worthy of a good roof, and in a district with a heavy rainfall is a necessity.

ENSILAGE.

Another way to provide for the lean months is by the manufacture of silage. The most popular method is the stack curing process, the others being a pit or above the ground silo. I have tried both stack and pit, preferring the pit owing to less labour in filling and no wastage as in the case with the stack method. I selected a site on sloping ground, where by sinking a circular hole 11ft. in diameter by 15ft. deep I was able to build up the earth another 3ft., making a pit 18ft. deep. A 1½in. pipe was placed in the centre of the hole, and secured at the top and bottom, an arm being attached which would revolve, giving the radius of a circle 10ft. in diameter. It will take 3,000 second hand hard bricks at £2 10s. per 1,000 including cartage, making a single brick wall 15ft. high, with 3ft. of double brick at the top. The 15ft. was laid with lime mortar and the double brick work with cement. Whilst the bricks are being laid, dry sand should be run in behind the bricks to fill the cavities between the earth and the bricks. Three bags of lime and two bags of cement, costing 25s. were used. The total cost of material was £8 15s. This pit will store between 40 and 50 tons of ensilage.

To weigh down the material, cover the surface with flat slabs fitting neatly, giving a small clearance to the brick-work, then apply 3 tons of logs and stones. I prefer to chaff all green stuff, maize, cereals, etc., into the pit, which saves a lot of waste when feeding.

To the cost of equipment must be added a chaff cutter, £28, 4½ h.p. oil engine, £60, also some transport unit to cart hay and ensilage. The 30 cwt. motor truck is the most popular, and is generally put to all uses.

CULTIVATION OF LAND AND ROTATION OF CROPS IN THE CLARENDON DISTRICT.

[A. A. HARPER, Clarendon.]

The first item of importance is to have the team and machinery in good condition, so that there will be no delay when the time comes for a start. Whatever the land may be, new or old, it should be fallowed in September, while the ground is soft. Plough to 5in. deep if sub-soil will allow it, and not more than 10in. to 10½in. furrows. That will turn over in a nice position to work down. If turning over a 12in. or 13 in. furrow, it will go too flat, and the harrows will not break it so well. Harrow it down before it gets too dry or too wet, land always works best when it is freshly ploughed. Cultivate in October and again in December, plough in February and harrow. Cultivate in April and harrow, run sheep over it when in a dry condition, and replough at the end of June or the beginning of July, and plant.

It is proposed to deal separately with each year's cropping operations. The crop recommended for fallow is pease. Pease do as well on fallow as wheat or oats, and a 50 per cent. better harvest will be obtained by sowing pease on old land. The amount of seed should be 3 bushels to the acre, together with 1½cwt. of Basic Slag, it should be drilled sufficiently deep to be covered nicely; then harrowed off and rolled.

Harvesting.—The crop should be cut when in a yellow stage; it may cause a little more inconvenience in cutting, but it is worth while because all the pease can be gathered. In cutting, roll into even reasonably tight rolls, just large enough for one man to handle, and place them in straight rows across the paddock so that the team when carting can drive along the side. This saves travelling around the paddock to collect the harvest. The carting should be executed as soon as possible and threshed to procure a good sample. One small team with 2 men for carting, and 4 men with 2 horses and a roller in a yard comprises a good working kit. They should clean up the crop at fairly short intervals in case of a change in weather conditions.

SECOND YEAR.

Presuming that the stubble has been cleaned up with sheep; cultivate and harrow in February, plough in April to the depth of 3in to. 4in. and harrow, recultivate at the end of May or early in June, and drill with 2bush. of wheat, and 1cwt. Basic Slag per acre. The wheat recommended is either Warden or Coral, or if a mixed crop is desired, 1bush. of wheat and 1½bush. of oats, together with the quantity of Slag before-mentioned. Drill sufficiently deep to cover the seed. When the crop is 2in. or 3in. high, a light roller run over it will do good. The cutting should take place when the grain is in a doughy stage, and it should be put into stooks as soon as it is cut, so that bleaching will not take place. The size of the stooks for good working in an average crop should be about 30 sheaves. Cart it after it has been cut about a fortnight if the weather conditions are suitable, and feed off the stubble with sheep.

THIRD YEAR.

Plough the land in February, and leave it turned up to the sun until the first rain, and then harrow. In April, cultivate, harrow in the rough, and roll. Plough in May and drill in 2½ bush. of oats with 1cwt. of Basic Slag, not too deeply; roll when the crop is 2in. or 3in. high, cut when the oats are in a yellow stage, stook when cut—in about 20 sheaves. Cart in from 2 to 3 weeks if weather permits. Should rain fall prior to the time of seeding, run the harrows over the land, but under no circumstances should this operation be done while the land is boggy or dry and dusty.

THE CASE FOR THE MAN ON THE LAND.

[M. J. VICKERS, Lenswood and Forest Range.]

This paper has been written in defence of the man on the land, because of the resentment which has been recently directed against him, when he has been forced to ask for some assistance. He was asked to produce more and is now being condemned for doing so. Australia's partial recovery is due to its exports of primary produce, which although of relatively low value, amount to huge totals on account of their immense volume. These reports prove that the primary producer is working harder than ever—growing twice the amount of goods to offset the poor price. A producer is not even recognised as an authority in his own business because he never claims to be one. So long as he figures in the public imagination as a dull, hard-working labourer he is selling his dignity and self respect for something less than a mess of pottage. As a matter of fact he is no such person—the great mass of them do more thinking than the average man and he, who without so much as the rudiments of what is erroneously called education, has succeeded in agriculture, has more sense, more honourable wisdom of real life and more courage to face its bad weather, emergencies, etc., than the city man, even though he be a university graduate. But the real producer never adds one cubit to his own stature, though it may be deserved.

The shippers talk down to the growners until the growers feel like country school boys who have grown old without making the last grade. They speak with that same air of blissful authority that a childless parson or maiden lady shows when they are advising real parents how to bring up their children. If we would only get up and talk back and compel their attention we may fire the imagination of the people with a sense of us and what we need and deserve my be granted with some of the fervour we bestow upon more spectacular heroes.

The grower does not defend himself from the talkers and writers, but they are the men who have built the world, nourished it and held it together in peace and war for ages and perish unhonoured and unsung because such people lack the endless use of their tongues. Theirs is the silent eloquence of work well done, of adversities and hardships bravely endured, like a season of bad weather. They are so absorbed in the labour of life that they fail to acquire the spoken art of interpreting themselves.

The world has now changed. The power of speech has become tyrannical. It is the front page method of controlling the public mind and determining the policies which control every circumstance in civilisation. Therefore, for a man not to speak and contend for his rights and his own point of view, is for him not to vote on his own fate. Every other class of men and workers has recognised this fact sooner than the producers. The fact is that tilling the soil through the ages has produced a psychic effect upon the minds of these men. It is a vocation, the first and oldest. The evidence of this fact is that all other men abandon an unprofitable profession, and the industrial worker will invariably leave his job for one that pays better, but in this country, in every country, age after age, men bred to the land stay on it, even to the point of starvation. Sweat of their brows in the open, whether it pays or not, and barring the flotsam and jetsam of them, they can no more be divorced from it by failures and poverty than will an artist give up painting because he cannot sell his pictures.

Although modern civilisation enables most of the population to live in the cities, every man retains a rudimentary instinct for the land, even though for two or three generations his people have been born and bred to city pavements. But they could not, and would not endure the plainness and quietness of such a life if they tried. It is an instinct—and that instinct to return is like the appendix—a lost ligament in living! Still they feel the pain of it occasionally, and mistake it for a craving for the country. But with the producer, that first enchantment of the soil is still so strong that he has remained unconscious of it, whilst the world which determines his fate and fortune has changed and left him still as inarticulate as he was a hundred years ago, when there was no such need as now for putting on the defensive and offensive of loud speaking to save himself from his critics. New ground cannot be cleared by talking—no man ever acquired an eloquent use of words by ploughing a field. He cannot change the weather by addressing the winds that control it. His good sense consists in preparing against floods and droughts. He becomes the student of the earth, of the life of seeds and plants. Nothing written—all secrets of the air and soil are to be learned by experience, no matter how many books on agriculture he may have read. Whatever his faults or limitations, he has learned enough and worked hard enough from the beginning to feed and clothe mankind, which is more than could have been done by any other class of man.

The producer is a great man and does not know it, consequently, the rest of the community does not know it either. He has become the victim of his own modesty and silence. This is the reason why so many designing and officious people presume to give him advice. He never says anything—not in public. The world has talked itself generally out of a sense of responsibility and wants to make the producer responsible. Let a fool get a fatal facility for words and he will talk his head off, giving a wise man advice if the wise man keeps silent. Thus they are about to mortgage the producers' self-consciousness, with the inferiority complex. His position is not peculiar to him, it is his outrageous patience and silence under so much provocation that is peculiar to him. In every walk of life it is the fellow who cannot achieve who appoints himself the critic of those who can.

An author can outdo his critics by writing another book or a painter by painting another picture—but the producer has no such opportunity for interpreting himself and his works. Up to the present time his only way of reach the public is the anonymous one of producing the bread that feeds it and this is all taken for granted.

The producer by his silence has made himself too easy to be absorbed. He has not disagreed with his critics enough to be even interesting. All people returning from England think it is their duty to bring our fruit export into the headlines of the paper as a bad news item, even though they may not know fruit, or even have seen it. They stand up and cast these faults like an unpaid account—yet nobody talks back.

Writers, speakers, &c., all kinds of intellectual people are invited to address appreciative audiences, but does anybody ever invite an honest producer to deliver a lecture on agriculture? They do not. Some of the best educated men in this country are farmers, but in the colleges, agriculture is taught by men who have studied it in books and laboratories. There is good in it, *but* there is no one among that learned body to teach from that best school—experience—the subtle and temperamental difference between theory and practice or to inspire students with the courage it takes to work out their own salvation in spite of earth, weather, and all the vicissitudes that are ever dogging us. Agricultural schools would turn out more working farmers and not so many agriculturists, if even they were given lectures by real producers.

CONIFERS.

[W. J. BISHOP, Lenswood.]

The name Conifer is descriptive of the plant "cone"—the shape of the fruit and "ferous"—bearing, thus all cone bearing plants are classified as Conifers. Cone bearing and cone shaped, this majestic family ranges from the mighty Redwood—the giant of all forest trees, to the dainty *Retinosporas, Biotas* and *Thuyas*, which grace rock gardens. But whether giant or dwarf, all are characteristically beautiful. Besides being noted for their undoubted beauty, Conifers are also the most useful and widely known of all timber trees. Referring to them by their common names the following is a list that forces one to realise that this claim is well founded: Oregon Pine, Baltic Fir, Canadian Spruce, Redwood, Cedar, Kauri and Rimu Pine of New Zealand and the locally grown pines, *Insignis* or *Radiata*. Although the timber value of these trees makes them indispensable, there are numerous by-products also. Of these the most important is paper pulp, and when one thinks of the mighty power of the press to-day, one realises how truly prophetic Shakespeare was when he spoke of "Tongues in Trees," artificial silk and synthetic wool are two other widely used products that claim the pine tree as their origin.

From resin is obtained turpentine, varnish and Stockholm tar, and from yet another Conifer—the Juniper, is distilled the useful spirit—gin.

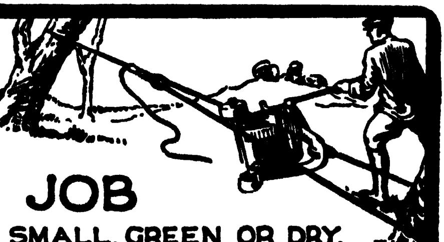
Before the trees can be put to these several uses it means in most instances that they have to be felled, but they can serve still other useful purposes while standing. The main one, and this concerns both orchadist and stockowner, is for breakwinds and hedges. Conifers are ideal for this purpose. Evergreen, and with spreading branches from the ground level, upwards, they make a dense wind break. The larger growing varieties quickly attain a height of from 50 to 100 feet, and if a lower hedge is required, numerous varieties can be had and kept trimmed from heights varying from 3 to 20 feet. These hedges are most ornamental, and offer a wide range in both colour and form.

Practically without exception, the vast range of these useful trees flourish in any country where Stringy-Bark growns naturally, and most of them also do well in Gum country.

While in no way wishing to detract from the merits of native timber, because all trees are useful and beautiful, the Conifers could be featured much more generally. Some varieties in particular are very rapid growers and mature quickly, and in a given time make more super feet per acre in good Stringy-Bark country, than any other timber trees. Australia herself is almost barren of Native Conifers. The Callitris—the family which includes the Murray Pine—is the only genus of the Southern mainland. Tasmania is the home of *Dacrydium Franklini*—the Huon Pine, now almost completely cut out. In Queensland, there are one or two species of *Araucaria* of which the Hoop Pine is most widely known, and New Zealand is the home of the famous Kauri Pine and the New Zealand *Rimu procorpa*. These, with the *Dammara australis Araucarias*, of which the Norfolk Island Pine and the Monkey Puzzle tree—*Araucaria imbricata*—of Chili constitute the main varieties of the Southern Hemisphere. In the Northern Hemisphere the position is very much different. There, the Conifer reigns supreme. The *Abies piceas* of Northern Europe and America are the main source of supply for the soft-wood timbers of the world. Lower down in Northern Africa, India, China and America the Cedar flourishes, and in California the Redwoods *Sequoia gigantea* and *sempervirens* have their habitat. The *Cryptomeria* is the principal tree of Japan, and *Pinus*—the true pine—is scattered all over the Northern Hemiphere.

When one considers the unbounded uses for these trees and remember that one and all of the varieties metioned will flourish in our Hills Districts, they should be put to a much greater use than is the case at present.

There is one great enemy to all trees—Pines in particular—and that is the bush fire menace, but if landholders of the Hills became tree minded, and planted them extensively—and to grow trees is to love them—the risk of bushfires would be greatly minimised, and with the intelligent clearing and burning of fire breaks, it would be safe to prophecy that serious outbreaks—most often caused by thoughtlessness and carelessness—would cease to exist.



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DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. SANDFORD & CO. LIMITED, reported on 1/10/35:—

BUTTER.—Butter production through September was satisfactory and the tonnage was greater than for many years past. Fortunately rains were received at opportune times throughout the month and, therefore, the feed came along nicely. Owing to the fact of our having obtained first prize at the Adelaide Show for butter which had been six weeks in cold storage, a strong demand continues with us both locally and for overseas. The London market is still firming and, as we have selling avenues in all parts of Britain, consignors are assured of best results. Local rates were without change, being:—Choicest creamery fresh butter in bulk, 1s. 2¾d. per pound; prints and delivery extra (this price is for local sale only and, under the quota system, the equalised price manufacturers will receive will be 1s. 0¾d. per pound, on which basis payments to cream suppliers will be calculated); separator lines, from 10½d. to 11½d. per pound for choicest; stores, 6d. to 8d. per pound (these prices are subject to equalisation levies).

CHEESE.—The output at present from the factories in the South-East is higher than for several years past and it looks now as though record quantities will result. Fortunately the London market appreciates the quality of the South Australian cheese and is asking for additional supplies. Shipments are going forward each week so that the stocks are being kept nicely cleared. There was a firming in the price of matured cheese owing to stocks now being considerably reduced. Rates are:—Large and medium, from 9½d. per pound; loaf, from 10d. per pound at store door, delivery extra; semi-matured and matured, 1s. to 1s. 0½d. per pound.

EGGS.—Production has gone forward rapidly during the last few weeks, the milder weather no doubt assisting in this respect. Exporting to London continues, but only the very highest grade will pass the inspectors, and there is a considerable proportion of the consignments which are not suitable and these have to be manufactured into egg pulp. Values are:—Ordinary country eggs, fair average quality, 5d. per dozen net; long distance rail or shipping eggs lower; selected new laid, clean eggs, full-sized, 10½d. to 11d. per dozen net.

BACON.—The turnover throughout the month was satisfactory, but has now lessened with the incoming of warm weather. Hams and bacon factory smallgoods on the other hand have improved in demand and values firmed:—Best quality sides, 9½d. to 9¾d. per pound; middles, 9½d. to 10d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 1s. 2d. to 1s. 3d.; cooked, 1s. 4d. per pound; lard, bulk, 5d. to 5½d., prints 6d. to 6½d. per pound.

ALMONDS.—Only limited quantities were marketed throughout the month and these sold readily at quotations:—Softshells and Brandis, 8½d. to 9½d.; hardshells, 5d. to 5¼d.; kernels, 1s. 9½d. to 1s. 10½d. per pound.

HONEY.—There are still very heavy stocks held in some merchants' hands and this is overshadowing the market somewhat so that there seems little likelihood of increased prices. Quotations were unchanged but sales are slow:—Prime quality clear extracted, 2¼d. to 2¾d. per pound; lower grades, 1d. to 2d. per pound.

BEESWAX.—Met with steady sale throughout the month although stocks were not heavy. Rates are:—1s. 4d. to 1s. 4½d. per pound according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms which are in every way the best equipped in the State. There was a strong demand experienced at each of the sales held, but during Show week supplies were very short. There has been an improvement since, but much heavier quantities could be placed satisfactorily. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. 9d. to 4s. 10d.; nice conditioned cockerels, 3s. 4d. to 3s. 8d.; fair conditioned cockerels, 2s. 4d. to 3s. 1d.; chickens, lower; heavyweight hens, 3s. 3d. to 3s. 9d.; medium hens, 2s. 8d. to 3s.; light hens, 2s. to 2s. 6d.; couple of pens of weedy sorts, lower; prime young Muscovy drakes, 3s. 8d. to 5s.; young Muscovy ducks, 2s. 6d. to 3s. 3d.; ordinary ducks, 1s. 3d. to 2s. 3d.; ducklings, lower; geese, 2s. 6d. to 4s.; goslings, lower; turkeys, good to prime condition, 8d. to 9d. per pound live weight; turkeys, fair condition, 6d. to 7½d. per pound live weight; turkeys, poor and crooked breasted, lower; pigeons, 5d. to 6d. each.

POTATOES.—New season's, 13s. per cwt.

ONIONS.—Brown Spanish, 9s. per cwt.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING MONTH OF AUGUST, 1935.

IMPORTS.

Interstate.

Apples (bushels)	783
Apple custard (bushels)	6½
Bananas (bushels)	15,816
Citrus—	
Grape fruit (bushels)	54
Oranges (bushels)	3
Passion fruit (bushels)	334
Paw Paws (bushels)	8
Pineapples (bushels)	1,263
Nuts—	
Peanuts (bags)	1,334
Peanut kernels (bags)	61
Popple (bags)	3
Beans (bushels)	94
Carrots (bags)	4
Cucumbers (bushels)	4
Onions (bags)	137
Potatoes (bags)	12,611
Potatoes, sweet (bushels)	30
Swedes (bags)	53
Bulbs (packages)	21

Corms (package)	1
Plants, fruit (package)	1
Plants, ornamental (packages)	118
Seeds (packages)	60
Shrubs (packages)	5
Trees, fruit (packages)	43
Trees, ornamental (packages)	3
Wine casks (No.)	2,155
Fumigated—	
Citrus—	
Grape Fruit (bushels)	53
Trees, fruit (packages)	28
Wine casks (No.)	21
Rejected—	
Bananas (bushels)	21
Citrus—Oranges (bushel)	1
Pineapples (bushels)	1½
Beans (bushels)	2
Potatoes (bags)	50

Overseas.

(State Law.)

Wine casks (No.)	1,267	*Fumigated*—Wine casks (No.)	71

Federal Quarantine Act.

	Packages.	Lbs.		Packages.	Lbs.
Seeds, &c.	8,438	1,560,354	Handles	35	—
Canes	203	—	Plants	2	20 (No.)
Tea chests	1,855	—	Timber	271,881	4,357,500 Sup. ft.

EXPORTS.

Federal Commerce Act.

		Packages.
England	Citrus—	
	Grape fruit	8
	Lemons	2
	Oranges	70
Germany	Citrus—	
	Oranges	3
India	Apples	884
	Citrus—	
	Grape fruit	10
	Lemons	8
	Oranges	79
	*Vegetables	30

		Packages.
Malta	Citrus—	
	Grape fruit	30
	Oranges	100
Netherlands, East Indies	Citrus—	
	Oranges	20
	*Vegetables	27
New Zealand	Citrus—	
	Oranges	31,194
Singapore	Citrus—	
	Lemons	1
	*Vegetables	33

* Potatoes excluded.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of September, 1935, also the average precipitation for September, and the average annual rainfall.

Station.	For Sept., 1935.	Av'ge. for Sept.	To end Sept., 1935.	Av'ge. Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·47	0·29	3·05	4·66
Marree	1·03	0·43	3·38	5·88
Farina	0·66	0·46	3·03	6·43
Copley	0·80	0·64	2·53	7·87
Beltana	0·62	0·73	2·45	8·48
Blinman	0·90	1·05	3·09	11·86
Hookina	0·47	0·97	2·90	11·25
Hawker	0·69	1·14	4·07	12·26
Wilson	0·47	1·08	3·96	11·79
Gordon	0·48	0·97	3·52	10·53
Quorn	1·15	1·31	5·37	13·22
Port Augusta	0·75	0·93	6·11	9·44
Bruce	0·88	0·96	4·37	9·87
Hammond	0·89	1·18	4·84	11·21
Wilmington	1·47	1·89	8·32	17·32
Willowie	0·74	1·43	5·75	12·25
Melrose	1·70	2·48	15·08	22·88
Booleroo Centre	1·01	1·70	8·58	15·21
Port Germein	0·67	1·30	7·30	12·53
Wirrabara	1·32	2·18	11·77	19·29
Appila	0·96	1·65	10·17	14·65
Cradock	0·44	1·02	3·33	10·82
Carrieton	0·93	1·19	5·81	12·23
Johnburg	0·78	1·09	4·39	10·58
Eurelia	1·11	1·33	4·83	12·79
Orroroo	0·79	1·27	6·27	13·20
Nackara	1·01	1·14	4·96	11 09
Black Rock	0·83	1·26	5·77	12·37
Oodlawirra	0·71	1·32	4·71	11·68
Peterborough	1·00	1·43	6·92	13·22
Yongala	1·07	1·59	8·72	14·44
NORTH-EAST.				
Yunta	0·54	0·72	3·47	8·55
Waukaringa	1·03	0·65	3·39	7·94
Mannahill	0·76	0·59	2·99	8·20
Cockburn	0·69	0·60	2·01	7·96
Broken Hill, N.S.W.	1·28	0·73	2·88	9·56
LOWER NORTH.				
Port Pirie	0·70	1·40	9·17	13·21
Port Broughton	0·87	1·53	10·93	13·88
Bute	0·98	1·65	10·81	15·44
Laura	1·34	2·15	12·22	17·95
Caltowie	1·01	2·02	9·37	16·74
Jamestown	1·22	2·12	11·44	17·69
Gladstone	1·02	1·95	11·10	16·29
Crystal Brook	0·95	1·76	12·09	15·78
Georgetown	0·84	2·16	11·21	18·37
Narridy	1·20	1·82	10·62	15·82
Redhill	1·31	1·80	13·59	16·59
Spalding	1·35	2·44	12·90	18·88
Gulnare	1·26	2·31	12·31	18·68
Yacka	0·92	1·78	11·55	15·39
Koolunga	0·88	1·65	10·49	15·38
Snowtown	1·17	1·69	12·17	15·74
LOWER NORTH—*continued*.				
Brinkworth	1·31	1·89	11·94	15·82
Blyth	1·34	1·95	14·13	16·78
Clare	2·33	2·86	18·24	24·51
Mintaro	1·55	2·97	17·57	23·42
Watervale	2·04	3·17	20·38	26·80
Auburn	1·84	2·83	18·33	23·98
Hoyleton	1·33	1·97	13·22	17·33
Balaklava	1·50	1·70	10·98	15·46
Port Wakefield	1·28	1·27	9·76	12·94
Terowie	0·70	1·50	6·86	13·35
Yarcowie	0·93	1·55	7·97	13·59
Hallett	1·21	1·94	11·95	16·46
Mount Bryan	1·38	2·22	13·29	16·83
Kooringa	1·43	2·09	11·94	17·85
Farrell's Flat	1·77	2·17	13·07	18·61
WEST OF MURRAY RANGE.				
Manoora	1·38	2·39	14·19	18·92
Saddleworth	1·16	2·26	14·38	19·60
Marrabel	1·48	2·36	14·93	19·96
Riverton	1·80	2·41	17·26	20·81
Tarlee	1·44	2·12	13·15	18·10
Stockport	1·87	2·05	15·50	16·93
Hamley Bridge	1·66	1·92	12·55	16·54
Kapunda	1·83	2·23	13·34	19·79
Freeling	1·55	2·02	13·97	17·83
Greenock	2·00	2·57	16·46	21·53
Truro	2·32	2·32	15·71	19·89
Stockwell	2·22	2·33	15·51	20·13
Nuriootpa	2·78	2·39	19·37	20·72
Angaston	2·78	2·61	17·36	22·42
Tanunda	3·14	2·51	19·53	22·02
Lyndoch	3·85	2·82	19·57	23·40
Williamstown	3·56	2·97	20·57	27·77
ADELAIDE PLAINS.				
Owen	1·60	2·09	11·93	14·66
Mallala	1·16	1·85	10·88	16·56
Roseworthy	2·63	1·99	14·82	17·40
Gawler	2·25	2·05	14·81	18·91
Two Wells	1·79	1·59	15·91	15·75
Virginia	1·98	1·79	14·90	17·18
Smithfield	2·07	2·05	15·15	17·64
Salisbury	2·03	1·91	15·20	18·56
Adelaide	2·77	2·09	18·75	21·15
Glen Osmond	3·40	2·76	21·68	26·05
Magill	3·35	2·73	21·12	25·53
MOUNT LOFTY RANGES.				
Teatree Gully	2·69	3·03	21·72	27·20
Stirling West	6·82	5·14	43·65	47·08
Uraidla	5·01	4·91	34·94	44·19
Clarendon	6·89	3·49	29·51	23·88
Happy Val'y Res.	4·21	—	21·91	—
Morphett Vale	3·71	2·50	19·38	22·66
Noarlunga	2·91	2·25	17·48	20·37
Willunga	3·35	2·81	20·85	26·02
Aldinga	2·47	2·29	16 04	20·27

RAINFALL—*continued.*

Station.	For Sept., 1935.	Av'ge. for Sept.	To end Sept., 1935.	Av'ge. Annual Rain-fall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	3·84	3·76	30·74	29·50
Inman Valley	2·80	—	27·33	—
Yankalilla	1·96	2·53	18·59	22·83
Mount Compass	5·71	—	—	—
Mount Pleasant	3·23	3·28	21·78	27·23
Birdwood	3·19	3·43	23·58	29·21
Gumeracha	3·81	3·76	27·48	33·41
Millbrook Res.	4·40	4·31	31·00	34·68
Tweedvale	4·86	4·22	33·18	35·99
Woodside	4·13	3·91	28·60	32·31
Ambleside	6·50	4·16	32·74	34·90
Nairne	4·42	3·38	25·01	28·22
Mount Barker	5·51	3·64	27·22	31·31
Echunga	6·74	3·87	31·51	33·30
Macclesfield	5·51	3·76	26·98	30·43
Meadows	6·72	4·35	31·60	36·16
Strathalbyn	2·89	2·24	17·39	19·31
MURRAY FLATS AND VALLEY				
Meningie	3·08	2·04	14·37	18·37
Milang	1·37	1·56	10·23	14·91
Langhorne's Ck.	1·95	1·69	11·99	14·87
Wellington	1·67	1·63	11·67	14·65
Tailem Bend	1·97	1·92	12·30	15·06
Murray Bridge	1·82	1·59	9·58	13·56
Callington	2·56	1·83	11·05	15·19
Mannum	1·21	1·31	9·41	11·49
Palmer	1·91	2·14	13·58	15·63
Sedan	1·47	1·37	7·53	12·11
Swan Reach	1·55	1·32	7·62	10·64
Blanchetown	1·17	1·01	6·06	11·01
Eudunda	1·36	1·95	13·41	17·17
Pt. Pass	1·40	2·46	13·32	—
Sutherlands	0·70	1·25	5·48	10·84
Morgan	0·54	1·00	4·53	9·17
Waikerie	0·84	1·10	5·67	9·65
Overland Corner	0·43	1·13	3·91	10·32
Loxton	0·86	1·42	5·62	11·54
Berri	0·67	1·25	6·10	10·17
Renmark	0·63	1·23	6·39	10·41
WEST OF SPENCER'S GULF				
Eucla	1·13	0·75	10·59	9·96
Nullarbor	0·96	0·56	11·66	8·81
Fowler's Bay	1·23	0·89	10·27	11·94
Penong	2·50	1·00	10·72	12·27
Koonibba	1·92	1·01	10·84	12·13
Denial Bay	1·64	0·83	9·14	11·36
Ceduna	2·09	0·85	10·26	10·16
Smoky Bay	1·87	0·89	9·65	10·53
Wirrulla	2·20	1·13	12·49	10·54
Streaky Bay	3·26	1·31	16·25	14·88
Chandada	2·09	1·17	12·02	—
Minnipa	1·77	1·33	11·22	14·06
Kyancutta	1·44	1·40	11·73	—
Talia	1·83	1·67	12·75	14·76
Port Elliston	1·61	1·46	15·15	16·54
Lock	1·62	1·77	13·53	16·52
Mount Hope	2·30	—	18·41	—
Yeelanna	1·44	1·88	17·16	15·94
Cummins	2·05	2·01	17·45	17·60
Port Lincoln	1·10	1·99	13·77	19·42
Tumby	0·83	1·72	11·23	14·12
Ungarra	1·44	2·14	14·30	16·85
Port Neill	0·89	1·59	9·79	13·09
WEST OF SPENCER'S GULF—*continued.*				
Arno Bay	1·08	1·54	10·74	12·65
Rudall	1·32	1·48	11·92	12·64
Cleve	1·66	1·69	14·23	14·83
Cowell	0·63	1·19	7·08	11·07
Miltalie	1·08	1·50	12·16	13·67
Mangalo	1·15	1·60	10·33	13·91
Darke's Peak	1·96	1·82	14·46	15·18
Kimba	1·61	1·22	10·39	11·82
YORKE PENINSULA.				
Wallaroo	0·47	1·35	10·67	13·98
Kadina	0·70	1·57	12·45	15·64
Moonta	0·61	1·43	10·96	15·06
Paskeville	1·40	1·60	11·34	15·49
Maitland	1·57	2·06	16·52	19·90
Ardrossan	1·04	1·52	11·61	13·97
Port Victoria	0·99	1·60	10·19	15·44
Curramulka	1·46	1·94	12·14	17·87
Minlaton	1·81	1·88	12·26	17·79
Port Vincent	1·22	1·81	10·47	14·43
Brentwood	2·00	1·76	13·39	15·55
Stansbury	2·05	1·94	13·09	16·82
Warooka	1·60	1·89	13·29	17·49
Yorketown	2·03	1·89	16·53	16·88
Edithburgh	1·55	1·81	13·66	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	2·63	2·16	25·67	24·82
Kingscote	2·12	1·87	19·05	19·14
Penneshaw	2·73	2·18	17·79	18·92
Victor Harbour	1·43	2·43	17·41	21·37
Port Elliot	1·35	2·25	13·98	19·93
Goolwa	0·91	1·96	12·43	17·85
Maggea	1·24	1·22	6·69	10·04
Copeville	1·49	1·55	9·11	11·51
Claypans	1·93	1·10	8·94	10·38
Meribah	1·24	1·48	7·14	11·31
Alawoona	1·39	1·14	7·43	10·36
Caliph	1·10	0·85	6·45	—
Mindarie	1·71	1·59	8·31	12·21
Sandalwood	1·81	1·65	10·30	13·66
Karoonda	1·58	1·76	11·34	14·36
Pinnaroo	1·34	1·73	7·14	14·43
Parilla	1·32	1·82	9·15	13·82
Lameroo	1·54	2·08	10·09	15·97
Parrakie	2·07	1·89	13·55	14·62
Geranium	1·83	2·07	14·38	16·51
Peake	1·46	1·97	14·26	16·01
Cooke's Plains	1·62	1·85	12·67	15·30
Coomandook	1·80	2·04	13·59	17·09
Coonalpyn	1·91	2·00	15·37	17·61
Tintinara	2·19	2·19	15·97	18·71
Keith	2·50	2·23	16·16	17·92
Bordertown	2·01	2·21	15·97	19·21
Wolseley	2·08	2·23	15·46	18·49
Frances	2·72	2·31	19·50	20·11
Naracoorte	2·21	2·61	21·24	22·66
Penola	1·80	2·82	21·10	26·01
Lucindale	2·17	2·53	24·93	23·34
Kingston	2·01	2·37	21·07	24·28
Robe	1·39	2·22	22·04	24·67
Beachport	1·52	2·40	24·58	27·09
Millicent	2·37	2·98	29·65	29·79
Kalangadoo	2·35	3·59	25·11	32·28
Mount Gambier	3·32	3·09	23·25	30·45

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Nov.	Dec.
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	420	7	5
Alma	*	—	—
Angaston	*	—	—
Appila-Yarrowie	420	1	6
Arthurton	*	—	—
Ashbourne	*	6	4
Auburn Women's	432	—	R
Balaklava	*	R	R
Balhannah	*	—	—
Balhannah Women's	*	20	18
Balumbah	421	—	—
Balumbah Women's	432	1	4
Barmera	*	—	—
Baroota	420	11	9
Beetaloo Valley	*	11	9
Belalie Women's	432	12	10
Belvidere	*	—	—
Berri	*	11	9
Blackheath	*	14	12
Black Rock	*	—	—
Black Springs	*	R	R
Blackwood	*	11	9
Block E	*	—	—
Blyth	*	22	27
Booborowie	*	11	9
Booleroo Centre	*	22	R
Boolgun	*	—	—
Boor's Plains	432	—	—
Boor's Plains Women's	—	—	—
Brentwood	*	4	2
Brimpton Lake	—	—	—
Brinkley	*	6	4
Brownlow	*	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	21	19
Butler	421	—	—
Calca	*	—	—
Caliph	*	5	3
Carey's Gully	*	—	—
Chandada	*	—	—
Chapman's Bore	—	11	9
Charra	*	—	—
Cherry Gardens	421	9	14
Chilpuddie Rock	421	6	4
Clare Women's	*	2	7
Clarendon	*	11	9
Collie	*	6	4
Coomandook	421	29	27
Coonalpyn	*	6	4
Coonalpyn Women's	*	—	—
Coonawarra	420	14	12
Coonawarra Women's	432	20	19
Cummins	*	8	13
Cungena	*	7	5
Currency Creek	*	11	9
Dudley	*	—	—
Echunga	*	27	R
Eurelia	*	9	14
Eurelia Women's	*	6	4
Finniss	*	—	—
Frances	*	—	—
Frayville	421	—	—
Gawler River	*	—	—
Georgetown Women's	432	12	10
Gladstone	*	8	6

Branch.	Report on Page.	Dates of Meetings.	
		Nov.	Dec.
Gladstone Women's	*	12	17
Goode	421	—	—
Goode Women's	*	—	—
Green Patch	421	7	5
Greenock	420	18	16
Gumeracha	*	11	9
Hanson	420	5	10
Hartley	421	6	4
Hindmarsh Island	*	—	—
Hope Forest	—	4	2
Hope Forest Women's	*	—	—
Inman Valley	*	21	19
Jamestown	*	20	18
Jervois	*	14	12
Kalangadoo	432	9	14
Kalangadoo Women's	—	9	14
Kangarilla Women's	*	21	19
Kanni	421	—	—
Karte	421	—	—
Karte Women's	*	—	—
Kelly	421	2	7
Ki Ki	*	—	—
Kilkerran	*	7	5
Koolunga	*	—	—
Koonunga	421	—	—
Koppio	*	13	11
Kulkawirra	421	12	10
Kyancutta	*	5	3
Kybybolite	*	7	5
Kybybolite Women's	*	12	10
Lameroo	*	9	7
Laura	*	9	7
Laura Bay	421	12	10
Laura Bay Women's	432	12	10
Lenswood and Forest Range	*	—	—
Light's Pass	420	—	—
Lipson	421	9	7
Lone Gum and Monash	*	21	19
Lone Pine	*	11	9
Longwood	*	—	—
Lyndoch	421	5	10
MacGillivray	*	5	10
McLaren Flat	*	—	—
McLaren Vale Women's	432	7	5
Maltee	421	7	5
Maltee Women's	432	—	—
Mangalo	*	—	—
Mangalo Women's	432	18	11
Marama	421	—	—
Milang	*	9	R
Millicent	*	22	27
Millicent Women's	432	—	—
Miltalie	421	9	7
Minnipa	*	—	—
Monarto South	421	—	—
Monarto South Women's	432	16	21
Moorlands	*	18	11
Moorook	*	—	—
Morchard	*	8	6
Morchard Women's	432	27	—
Mount Barker	*	18	16
Mount Bryan	*	—	—
Mount Compass	*	—	—
Mount Gambier	420	8	13
Mount Hope	*	5	10
Mount Pleasant	*	6	4
Mudamuckla	*	9	14
Mudamuckla Women's	432	—	—

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.		Branch.	Report on Page.	Dates of Meetings	
		Nov.	Dec.			Nov.	Dec.
Mundalla	*	—	—	Snowtown Women's	*	7	5
Mundalla Women's	*	14	12	South Kilkerran	—	4	2
Murray Bridge	*	13	—	Springton	*	6	4
Murraytown	—	—	—	Stanley Flat	*	18	16
Mypolonga	*	—	—	Stockport	*	—	—
Myponga	*	21	19	Strathalbyn	*	13	11
				Sutherlands	420	—	—
Nantawarra	—	7	5				
Narridy	420	—	—	Tantanoola	420	2	7
Narridy Women's	—	—	—	Tantanoola Women's	432	6	4
Narrung	*	—	—	Taplan	*	5	3
Nelshaby	—	—	—	Taplan Women's	*	—	—
Nelshaby Women's	*	—	—	Taragoro	*	7	5
Nunjikompita	421	7	5	Tarlee	*	—	—
Nunkeri	421	7	5	Tatiara	*	—	—
				Tintinara	*	—	—
O'Loughlin	*	11	9	Truro	*	18	R
O'Loughlin Women's	432	—	—	Tweedvale	*	21	19
Owen	*	11	9	Tweedvale Women's	*	18	16
Palabie	*	—	—	Ungarra	421	—	—
Parilla	*	19	17	Upper Wakefield	420	7	—
Parilla Women's	432	20	18				
Parilla Well	421	11	9	Wallala	*	13	11
Parilla Well Women's	—	26	31	Wandearah	*	5	10
Parrakie	*	—	—	Warcowie	420	5	10
Parrakie Women's	*	26	31	Warcowie Women's	432	—	—
Paskeville	*	5	10	Warramboo	*	5	10
Penola	*	2	7	Warramboo Women's	432	—	—
Penola Women's	*	—	—	Wasleys	421	14	12
Penwortham	*	6	4	Wasleys Women's	432	7	5
Petina	*	23	28	Watervale	*	18	16
Pinbong	*	—	—	Weavers	*	11	9
Pinbong Women's	432	—	—	Wepowie	*	11	9
Pinkawillinnie	*	—	—	Wepowie Women's	432	—	—
Pinnaroo	*	—	—	Whitwarta	420	R	R
Pinnaroo Women's	432	1	6	Wilkawatt Women's	*	19	17
Port Elliot	*	—	—	Williamstown	420	—	—
Pygery	*	5	10	Williamstown Women's	*	6	4
Pygery Women's	432	—	17	Willowie	*	25	23
				Wilmington	420	19	17
Ramco	—	11	9	Wilmington Women's	*	14	R
Redhill	420	R	R	Wirrabara	*	—	—
Rendelsham	*	9	7	Wirrabara Women's	*	21	19
Rendelsham Women's	432	—	—	Wirrilla	*	9	7
Renmark	*	—	—	Wirrilla Women's	*	—	5
Riverton	*	11	9	Wolseley	*	9	14
Roberts and Verran	*	—	—	Wudinna	*	—	—
Rosedale	421	—	—				
Roseworthy	*	—	—				
				Yadnarie	*	5	10
Saddleworth	*	8	6	Yandiah	*	8	13
Saddleworth Women's	432	5	3	Yeelanna	*	6	4
Scott's Bottom	*	9	7	Younghusband	*	—	—
Sheoak Log Women's	432	—	—	Yundi	421	—	—
Shoal Bay	*	5	10	Yurgo	*	—	—
Snowtown	420	8	13	Yurgo Women's	*	—	—

* No report received during the month of September. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
South-Eastern District.				
Coonawarra	19/8/35	24	Annual Meeting	J. M. Kain
Coonawarra	21/8/35	150	Annual Social	J. M. Kain
Mount Gambier	9/8/35	14	" Superphosphate "—A. A. Sassanowsky	J. E. Morphett
Allandale East	5/9/35	7	Discussion—Annual Congress	R. T. Laslett
Tantanoola	7/9/35	20	Discussion—Congress Debate, " Dairying *v.* Sheep "	L. J. C. Osborne
Upper North District.				
Warcowie	27/8/35	14	Social. Addresses—E. L. Orchard and F. C. Richards	A. F. Crossman
Appila	6/9/35	8	Question Box	E. H. Wurst
Wilmington	10/9/35	12	" Rope and how to make it," J. S. Hill	Chas. Cole
Warcowie	10/9/35	10	Discussion—Congress	A. F. Crossman
Baroota	9/9/35	11	" Bulk Handling of Wheat " —J. Hillam	E. W. Hulster
Mid North District.				
Redhill	3/9/35	61	Address—W. J. Spafford	Lance Harris
Snowtown	28/8/35	23	Wool Demonstration—C. A. Goddard	A. R. Hocking
Narridy	14/8/35	20	Address—C. A. Goddard	J. Klingner
Narridy	10/9/35	22	" Wheat Marketing "—Mr. Harrington	J. Klingner
Narridy	5/9/35	60	" Pasture Improvement "— —Dr. A. R. Callaghan	J. Klingner
Lower North District.				
Upper Wakefield	29/8/35	13	Address—R. I. Herriot	H. W. Gregor
Hanson	28/8/35	70	Visit to Roseworthy College	M. de N. Lucas
Williamstown	29/8/35	6	Annual Meeting	W. R. Parmenter
Sutherlands	4/7/35	19	Address—W. C. Johnston	L. B. Doecke
Sutherlands	1/8/35	14	Annual Meeting	L. B. Doecke
Greenock	19/8/35	20	" Poultry on the Farm " —G. C. Cartwright	A. Schubert
Whitwarta	29/8/35	20	Wool-classing Demonstration—C. A. Goddard	F. J. G. Collins
Light's Pass	9/9/35	18	Addresses—Bert Boehm and Nicholls	C. A. Verrall

REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
LOWER NORTH DISTRICT—*continued.*				
Rosedale	9/9/35	15	"Plant Evening"	W. George
Hanson	10/9/35	18	"Wool-classing"—Geoff. Gask and F. J. Turner	M. de N. Lucas
Koonunga	11/9/35	11	"Noxious Weeds"—E. Kleinig	H. Mibus
Lyndoch	13/8/35	45	Lantern Lecture—Shell Co.	J. S. Hammat
Lyndoch	10/9/35	10	Formal business	J. S. Hammat
Wasleys	12/9/35	13	Discussion—"Silage"	C. R. Currie
Upper Wakefield	12/9/35	9	"Value of Bureau Meetings"—Mr. Kiely; "Parasites in Pigs"—C. Roberts	H. W. Gregor
WESTERN DISTRICT.				
Nunjikompita	3/8/35	17	Annual Meeting	P. A. Luestner
Nunjikompita	15/8/35	21	Address—W. H. Brownrigg	P. A. Luestner
Goode	14/8/35	10	Wheat Commission Report	B. A. Linke
Kelly	31/8/35	26	"Raising Export Lambs"—J. W. Parsons	F. R. Illman
Kelly	31/8/35	26	Discussion—Bulk Handling	F. R. Illman
Maltee	5/9/35	14	"First Aid"—H. Box	E. Schwarz
Miltalie	6/9/35	10	Homestead Meeting at D. G. Ramsey's. Address—H. D. Adams	S. D. Ramsey
Green Patch	12/9/35	15	Annual Meeting	C. J. Whillas
Laura Bay	10/9/35	15	"Marginal Areas"—J. W. Blumson	P. S. Morrison
Goode	11/9/35	5	Discussion—Congress	B. A. Linke
Ungarra	9/9/35	13	"Butter Production"—A. Brice	W. G. Gordon
Butler	17/9/35	8	Formal Business	C. F. Jericho
Balumbah	10/9/35	5	Discussion—Congress	J. E. Swann
Chilpuddie Rock	11/9/35	8	"Crop Rotation"—H. Brown	H. Brown
Lipson	31/8/35	14	"The Wool Clip"—E. L. Barraud	M. Barraud
EASTERN DISTRICT.				
Kulkawirra	20/8/35	8	Discussion—Sheep Diseases	H. J. Elliot
Karte	30/5/35	29	Inaugural Meeting	M. E. Small
Karte	14/6/35	58	Social. Address—F. C. Richards	M. E. Small
Karte	10/7/35	35	Address—R. L. Griffiths	M. E. Small
Karte	14/8/35	29	Question Box	M. E. Small
Kanni	29/8/35	16	Annual Meeting	E. H. Schulze
Nunkeri	20/6/35	10	Annual Meeting	E. R. Poltz
Nunkeri	2/9/35	18	Address—R. L. Griffiths	E. R. Peltz
Parilla Well	3/9/35	50	Wool Classing Demonstration—Mr. Dunsmore	E. C. Slater
Marama	10/9/35	7	Discussion—Congress Agenda	T. C. Hinkley
Coomandook	24/9/35	15	Address—R. L. Griffiths	W. R. Trestrail
SOUTH AND HILLS DISTRICT.				
Yundi	7/8/35	—	"Fertilisers"—T. M. Conroy	T. R. Smart
Hartley	11/9/35	8	Papers—C. Faehrmann, H. B. Wundersitz, and H. Brook	W. John Brook
Cherry Gardens	7/9/35	13	"Fat Lambs"—K. Jacobs	A. R. Stone
Frayville	13/9/35	11	"History of Superphosphate"—W. Lindner	H. H. Ramm
Monarto South	21/9/35	21	Congress Delegates Report	C. F. Altmann

FORTY-SIXTH ANNUAL CONGRESS—WOMEN'S BRANCHES.

[*The proceedings of the Opening Session will be reported in the general report of the Congress.*]

Attendance of Delegates.

The following Branches appointed delegates and the figures indicate the number of sessions for which attendances of delegates were recorded:—

Auburn: Miss L. Dennison (4), Mrs. H. O. Kench (6); *Balumbah*: Mrs. A. Ellis (5), Mrs. A. J. Swann (6); *Belalie*: Mrs. E. L. Orchard (6), Mrs. W. E. Symonds (4); *Boor's Plains*: Mrs. I. M. Chynoweth (0), Mrs. G. Rodda (0); *Clare*: Mrs. J. C. Dux (4), Mrs. D. McFeat (6); *Coonalypn*: Mrs. J. P. O'Donoghue (5), Miss E. E. George (6); *Coonawarra*: Mrs. W. L. Redman (5), Mrs. O. M. Skinner (6); *Eurelia*: Miss M. W. Stott (3), Mrs. M. P. Dinon (4); *Georgetown*: Mrs. A. J. Lyons (6), Miss J. Crawford (3); *Gladstone*: Mrs. J. Lesue (5), Mrs. J. A. Flavel (5); *Goode*: Mrs. P. A. Lange (4), Mrs. D. Fagan (5); *Hope Forest and Dingalbledinga*: Mrs. L. Fincher (4), Miss I. Barclay (3); *Kalangadoo*: Mrs. H. V. Dowdall (5), Mrs. M. Hunt (6); *Kangarilla*: Mrs. G. Thorpe (4), Mrs. Roberts (3); *Karte*: Mrs. H. W. Trowbridge (6), Mrs. D. R. Flavel (6); *Kybybolite*: Mrs. L. J. Cooke (5), Mrs. A. R. Rowe (5); *Laura Bay*: Miss T. E. Barnett (4), Mrs. E. E. Lowe (6); *Maltee*: Mrs. C T. Schwarz (5), Mrs. H. J. Schwarz (4); *Mangalo*: Mrs. R. Crettinden (3), Mrs. A. J. Turner (2); *McLaren Flat*: Mrs. J. Foggo (0), Miss F. Bell (2); *Millicent*: Mrs. M. Redman (6), Mrs. L. R. Elton (6); *Monarto South*: Mrs. H. B. White (4), Miss M. Hartmann (4); *Morchard*: Mrs. H. M. Brown (4), Mrs. J. Twigden (5); *Mudamuckla*: Mrs. G. H. Noske (5), Miss G. Kreusler (5); *Mundalla*: Mrs. E. Golding (5), Miss M. L. Jones (5); *Narridy*: Mrs. R. Klingner (5), Miss B. Reynolds (5); *Nelshaby*: Miss J. Bain (4), Miss A. Lawrie (4); *O'Loughlin*: Mrs. A. Kloeden (5), Miss M. Kloeden (4); *Parilla*: Mrs. G. Childs (4), Mrs. R. E. Welden (5); *Parilla Well*: Miss V. M. Ireland (4), Miss J. M. Blacksell (4); *Parrakie*: Miss J. Halliday (5), Mrs. E. Lahne (5); *Penola*: Mrs. T. Kidman (4), Mrs. E. E. Kidman (5); *Pinbong*: Mrs. A. Rehn (6), Mrs. J. W. Scholz (5); *Pinnaroo*: Miss N. Mattiske (5), Miss K. O'Loughlin (4); *Pygery*· Miss E. Woodrup (5), Mrs. R. Woodrup (5); *Rendelsham*: Mrs. Z. A. Bignell (5), Miss P. Foster (5): *Saddleworth*: Mrs. G. S. Crawford (5), Miss G. E. Frost (5); *Sheoak Log*: Mrs. V. A. Bowden (6), Miss K. Bamman (4); *Snowtown*: Mrs. B. Thomas (5), Mrs. A. M. Robinson (5); *Tantanoola*: Mrs. H. J. Edgcumbe (5), Mrs. W. Pycroft (5); *Taplan*: Mrs. P. Flynn (5), Mrs. B. Moffatt (5): *Warcowie*: Miss L. G. Martin (6); *Warramboo*: Mrs. A. M. Steer (5), Miss J. P. Patterson (5), *Wasleys*: Mrs. A. W. Wilson (1), Miss J. Braun (4); *Wepowie*: Mrs. J. Burns (5), Miss E. Roocke (6); *Wilkawatt*: Mrs. A. Sumsion (4), Mrs. H. H. Pritchard (5); *Williamstown*: Mrs. J. S. Hammat (6), Mrs. G. E. Cundy (0); *Wilmington*: Mrs. L. Cole (6), Mrs. J. M. Pengilly (6); *Wirrabara*: Mrs. A. Curtis (6), Mrs. A. Kranz (5); *Wirrilla*: Mrs. W. R. Woods (2), Miss J. Schunke (4); *Yurgo*: Mrs. M. Hopgood (6), Mrs. N. Easton (5).

Tuesday, 17th September.

Morning Session.

(Sessions were held in the Women's Non-Party Rooms, Grenfell Street.)

Mrs. J. S. Hammat, of Williamstown, was elected unopposed as President, an office she has been asked to fill every year since the Women's Branches held their first Congress.

Mr. H. E. Eglinton, head cutter of Messrs. Charles Birks & Co. Limited, gave a demonstration, "Alterations and Adjustments of Patterns and Garments."

PASTRY.

[MISS M. STOTT, Eurelia.]

"For a dozen batches of pastry spoilt in making, a hundred are spoilt in the baking."

A good heat to start with is a necessity, and in the baking of small pastry generally a sharp heat may be maintained to the end.

For pies, &c., of a plain sort, and with a thick paste, the heat must be slightly reduced after the pastry has risen, so that the contents may have time to cook properly.

More care is needed in baking raised pastry, both sweet and savoury, as there is more or less fear of scorching. Should an article become brown enough before it is sufficiently cooked, a sheet of slightly wetted or greased paper should be twisted or laid over it. A tray of salt is used by some bakers to put under a pie should the oven be too fierce.

To test the heat of the oven a little dry flour may be sprinkled on the shelf or baking-tin, and should it turn brown at once, the oven is far too quick even for smallgoods; a pale straw-colour is indicative of the right heat for pies and solid pastry generally, while for small articles the tint should be a trifle deeper. Should the flour not turn a colour at all for the first minute, the articles must be put by for a time, as the oven is too slow for any pastry.

To know when pastry is done appears troublesome to beginners, though it is really very simple. The time when one is most likely to be misled is in the case of a pie, &c., that becomes just a light brown, and, of course, the surface of the pastry appears to be baked. When any doubt exists the point of a steel skewer or small knife should be inserted in the centre of the crust; if it can be withdrawn clean it is done, but should soft particles stick to the knife, it is not baked enough.

METROPOLITAN AND EXPORT
ABATTOIRS, ADELAIDE

MANUFACTURERS OF

Meat Meal for Pigs

Read Report of Trials made by PROF. PERKINS,
Journal of Agriculture, January and July, 1921.

Meat Meal for Poultry

For full information on above write to

The GENERAL MANAGER, Metropolitan and Export Abattoirs Board, Gepp's Cross, S.A.

ALSO MANUFACTURED—

BLOOD MANURE. BONE MANURE. BONE MEAL.

There is yet left a way of damaging if not actually spoiling the cooking, that is, to take it straight from the oven to the pantry or cellar, and this is often done for want of thought. The change in the temperature is too sudden, and the pastry will be far less light than if left in the place it is baked in for a time before removal.

Crust.—1lb. flour, 2ozs. sugar, 3ozs. butter, 1 tablespoon sugar, one-third of a pint of water. Rub butter into flour very smoothly, add sugar, then mix to a smooth paste with milk. Roll thin and bake in a moderate oven.

A DINNER FOR FORTY PERSONS.

[Miss J. Braun, Wasleys.]

Although catering is not an everyday subject, occasionally we are asked to cater for a number of people, and the question arises: what we need and how much. Bureau Conferences, for instance, are often arranged by a committee of women, and this paper may be helpful to some. I have written my paper according to experience gained by me over a number of years. The following is ample for 40 persons:—Menu: Cold roast turkey and pickled pork, cold roast sirloin of beef, cold roast lamb and mint sauce, cold ox tongue. Vegetables: French beans, pumpkin, baked and mashed potatoes. Sweets: Plum pudding and brandy sauce, apple pie and cream, sago custard, trifle and jelly, celery, cheese, fruit.

First, consider the size of the turkeys. Two 20lb. ones will be required. These should be obtained two days before, dressed and cleaned, and then next day stuffed and cooked. The seasoning required for turkeys of this size is 2½ loaves stale bread, dripping, 2 large onions, 2 eggs, salt, pepper, and mixed herbs. Rub the bread down, rub dripping through, add onions, chopped parsley, herbs, pepper, and salt, and bind with 2 eggs well beaten. Stuff the breast also. Bake in a moderate oven for 4 hours, basting several times.

1 leg of pickled pork, about 8lbs.; boil about 3 hours the day before required.
1 sirloin of roast beef, about 4lbs., cook 1½ hours.
1 leg of lamb, about 5lbs., cook about 2 hours.
1 ox tongue, boil according to size, put into mould and press.

Always serve pickles and sauces with cold meats, but vegetables take the place of salads, and this is the quantity required:—8lbs. of French beans, 80 pieces of pumpkin, 80 pieces of boiled potatoes, and 40 pieces of potatoes for baking.

SWEETS.

Plum Pudding.—Mix the dry ingredients the day before required. 1lb. suet (finely chopped), ½lb. flour, ½lb. breadcrumbs, 1lb. stoned raisins, 1lb. currants, ½lb. sultanas, ½lb. mixed peel, 1oz. mixed spice, 1 grated nutmeg, ½lb. sugar; mix together, with 1½ cups milk, to which has been added 2 teaspoons carbonate soda dissolved in boiling water. Put into a dry but well floured cloth and boil for 4 hours. This serves about 20 people. Double this quantity for 40.

Apple Pie.—Stew 8lbs. apples, add cloves, 2lbs. sugar, water.

Pastry.—The puff pastry can be bought; 2lbs. makes about 40 2in. squares.

Sago Custard.—A 4-egg custard is required.

Trifle and Jelly.—Allow a bowl of trifle to every 5 persons, and the same quantity of jelly. Line the bowl with stale sponge cake and moisten with Muscat wine. Pour over boiled custard and add chopped almonds and cocoanut.

Jellies.—Four 6d. packets of jelly crystals, each of a different kind and colour.

Afternoon Session.

THE FLOWER GARDEN.

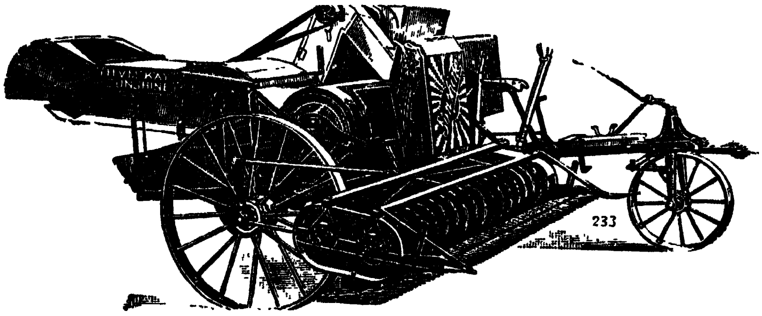
[Miss J. Halliday, Parrakie.]

How many people stop to think of the value of flowers? How pleasing and cheering it is to be able to go into one's garden for awhile. At times flowers may be real company. We watch with interest from the time the seeds are planted until the first bud appears and it bursts to display its fine colour.

SUNSHINE MASSEY HARRIS

HARVESTING MACHINES

REAP BULK OF AUSTRALIA'S GRAIN CROP.



SUNSHINE HEADER HARVESTER 6ft., 8ft. 10ft.

Even when crops are badly infested with thistles or other weeds, and the crop is storm beaten and tangled, these Machines equipped with modern Croplifters will raise the grain and procure all the heads possible. *Write for Catalogue, Prices and Terms.*

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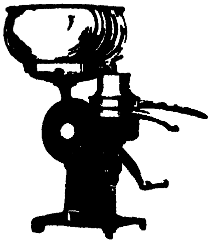

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Royal Agricultural Society's Show, 1935.

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A. W. SANDFORD & Co., Limited,
Grenfell Street, Adelaide.

Flowers are most extensively used for decorating, and how they do help to beautify the home, churches, and hospitals—inside as well as out.

Gardening in the outback areas is quite a different problem to gardening in the city. In the country there are very few rock gardens to be seen, with crazy paths, and tiny green Lippia plants creeping between the stones.

Here, there are many disadvantages to contend with. A very good way to border the garden beds is with stone; small beds are to be preferred to large; they are easier to water and weed and also pick the flowers.

Mallee roots of uniform size and trimmed make very good borders, and can be made to have a very effective appearance if a border of Pansies, Virginian Stocks, or in the summer Portulacca, are planted to form thee borders. Two things are essential for successful flower gardening—suitable water and just that little effort made at the right time of the year.

Usually it is hard to keep the garden paths free from weeds, but if rubble is spread and rammed down, the difficulty should be overcome. It is advisable to lay the garden out on the sunny side of the house, and shelter it as much as possible.

There are various flowers that are perennial, and when cut back after flowering —with the exception of being watered—need very little attention, such as Chrysanthemums and Perennial Asters.

The garden should be watered either before the sun rises or after it sets; it is not harmful to let the water run slowly from the hose during the day around the roots of the plants. If plants are established before the winter really begins—while the soil still retains some of its warmth—they will have a chance to become established before it is too cold.

It is quite easy to raise young plants in seed-boxes, and the transplanting can be carried out when the weather is favourable. Raise the seedlings in the home garden, and then they are accustomed to the climate. Plenty of old manure well worked into the soil and a very little superphosphate put around each plant just before flowering, will hasten the growth.

Iceland Poppies, Pansies, Linarias, Stocks, and Marigolds planted in January or February will provide winter flowers.

There are also many shrubs that will help to make the garden look green, and generally improve the surroundings of any homestead.

HOUSEHOLD PESTS AND THEIR CONTROL.

[Mrs. W. E. Symonds, Belalie.]

Not only are humans subject to attack by insects and other parasites, but stores of food, furnishings, structural timbers, and the sheltered conditions found in the household, offer attraction to many destructive pests, most of which are insects.

The number of inquiries each year from correspondents to daily and other papers shows that the depredation of household pests is a very important matter and must result in considerable loss. This loss is not always due so much to the quantities devoured by the pests, as to the waste of material condemned because of their presence.

INSECTS ATTACKING FOODSTUFFS.

Blowflies.

This group offers the widest range of household pests, the most conspicuous of which is the blowfly. Of the several species in this country, the most troublesome are the large Blue Bottle or the Brown Blowfly; the former is the more conspicuous and has been described as the "noisy spoiler of meat." These flies normally breed in decaying animal matter and enter dwellings for the purpose of shelter, but they are more often attracted by odours. Apart from the annoyance caused by these insects, they readily deposit their eggs upon exposed meat.

The control of Blowflies is a community matter. It is useless for an individual to attempt control if his neighbours do not join in the campaign. It has been found that Blowflies will travel a radius of fully 10 miles from their breeding grounds. A great deal could be done to check the nuisance by organised effort in the burial or burning of all carcasses in accumulations of decaying organic matter in municipal dumps as well as on farms and in back yards.

Wire screens at doors and windows are a necessity. In regard to protecting meat from Blowflies, there should be no trouble if a fly-proof safe is used. Troughs attached to windows are a wonderful help; fill these with kerosene and all stray flies will be trapped.

Though the ordinary wire screen or perforated zinc is sufficient to protect food from large insects, it is necessary to use fine mesh wire gauze to exclude certain very small flies that are sometimes troublesome. One such is a small black insect that breeds in meat of all kinds. Another is the Pomace-Fly, orange coloured, the maggots of which live in fruit, pickles, and milk, etc. A third and somewhat larger fly is the Cheese Skipper Fly, the maggots of which infest cheese and are able to leap four or five inches.

All these flies reproduce very rapidly—a generation developing within a fortnight. It is unwise to eat food contaminated by these insects, as the larvae are able to live in the human digestive tract and cause irritation.

A constant watch must be kept on the Common House Fly, and tanglefoot, poison paper, insectibane, and fly-tox can all be used with good effect.

Of the other insects feeding on a wide range of foodstuffs may be mentioned Silver Fish, Cockroach, Cricket, Larder Beetle, and Ants.

SILVER-FISH.

Silver Fish are wingless, torpedo-shaped insects, covered with a silvery dust. They have a pair of long feelers from the head and three tail-like appendages from the end of the body. They run swiftly and readily evade capture. Their food is principally of a starchy nature and they are found in dark cupboards, or among books and behind wall papers—the glaze and starch from which affords them nourishment. It should be borne in mind that Silver Fish thrive best when undisturbed, consequently the frequent cleansing of cupboards and dusting of books will tend to restrain their development. In cases of severe infestation, frequent dusting with Pyretheum Powder is an effective means of control.

COCKROACHES.

These insects abound in kitchens and pantries, where conditions are warm and moist and where there is abundant food supply. These conspicuous insects are more or less oval in outline, flattened with spring legs. During the day they lie concealed in any convenient crevice and emerge at night to seek food; they run

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very rapidly when disturbed to the nearest shelter and are omnivorous in their diet. The eggs of cockroaches are enclosed in a small horny capsule and placed in a crevice where there is sufficient moisture and warmth. The young insects, although smaller, resemble the parents in general appearance. When a house is badly infested by Cockroaches, the only reliable remedy is to fumigate with Calcium Cyanide, a procedure very dangerous to life and necessitating the complete vacation of the premises for the time being. For mild infestations, however, dusting with Pyretheum will suffice; other remedies are Borax sweetened with sugar, and cucumber rind.

CRICKETS.

Another species that sometimes invades houses is the Black Cricket; the insect that sings shrilly during the night from spring to autumn. It is related to the Cockroaches. There have been times when during a plague of these Crickets in New Zealand they have not only devoured the vegetation out of doors but entered houses and eaten such things as wall paper, shoes, etc.

LARDER BEETLE.

Frequently considerable damage is done to animal food products such as all kinds of meats, cheese, skins, and feathers, by the larvae of the Larder Beetle. The larvae are covered with hairs and have a pair of spines on the back close to the end of the body; they are dark brown in colour and reach a length of about half an inch. All foods infected with this insect should be destroyed and the store room thoroughly cleaned out and treated with Pyretheum.

ANTS.

In certain localities Ants are troublesome and it is a very difficult matter to protect food from them. Ants construct their colonies underground in rotten trees, posts, and between the walls of buildings. Where garden plants are infested with scale and aphids, the ants are attracted for the purpose of collecting the sweet "honey dew" excreted by these insects.

In the control of Ants the following steps should be taken:—If possible, locate the colonies by following the colonies of foraging ants. Where this is done then simply treat the breeding grounds with boiling water—the most effective insecticide.

As a further precaution spray all garden plants infested with scale and aphides, using Red Oil for the former and Black Leaf 40 for the latter.

Sometimes the ant colony cannot be located, especially if it is situated beneath a house or between the walls. It is then necessary to resort to poisoning. Purple Powder is best for this.

FLOUR MOTH.

The next group of insects are less cosmopolitan in their tastes, restricting their depredations to farinaceous products. The most common of these is the Mediterranean Flour Moth, the caterpillars of which web together into masses by means of the silk they spin.

Another related insect is the Indian Meal Moth, the caterpillars in this case, which feed upon meal, nuts, fruits, raisins, and currants, do not web together the food they eat.

In addition to these moths, oatmeal and such-like products are attacked by the larvae of certain beetles, for example, the Yellow Meal Worm and the Cadelie. The former larvae is hard and shiny, yellowish in colour, with reddish-brown transverse bands, and grows to a length of a little over 1in., while the latter is whitish with a reddish-brown head, and attains a length of about ¾in.

To control insects infesting flour meal and similar products it is a simple matter to store these materials in insect-proof containers. When small quantities of material are infested, the insects can be destroyed by placing the material in an oven at a temperature of 130 to 140 degrees Fahr., the insects' remains can then be removed by sifting.

INSECTS ATTACKING FABRICS.

A considerable amount of destruction of clothes, carpets and tapestries is brought about by insects. The clothes moths are the most universal in this respect. There are two important species—the web-spinning species and the case maker. Both are small insects about ¼in. long when the wings are closed, the former being a pale yellow colour and the other a dark buff with the wings spotted. They frequent places where the light is subdued, and cannot tolerate direct sunlight—a point to be remembered. The larvae of the web spinners construct silk shelters in the material infested, whilst those of the case maker spin tightly woven tubular cases to which pieces of fabric are attached, and in these shelters they spend their lives.

If fabrics are to be stored for any length of time, then it is essential to protect them from Clothes Moths by placing them in insect-proof chests or in cardboard boxes or paper bags sealed with paper strips. It is desirable also to scatter fresh Napthalene amongst the fabrics. In any case it is advisable to thoroughly brush stored materials periodically, and hang them for a time in direct sunlight.

Where infestation has already taken place, put the fabrics to be treated in an airtight trunk and lay on them a saucer containing about 3 fluid ounces of Carbon Bisulphide, close and seal the lid, and allow it to stand for 48 hours in summer temperature or longer in winter.

No naked flame should be exposed in the vicinity during fumigation as this fumigant is highly inflammable.

Sometimes upholstering and carpets are attacked, but this can be overcome by treating with Benzine or by the frequent use of a vacuum cleaner. The Clothes Moths larvae may frequent floor cracks where dust has accumulated, and such places should be thoroughly cleaned out. Damage is also done to the felt on piano keys, but treating the felt with Benzine will remedy the matter

THE HOUSE FLY.

Certain insects beyond causing annoyance to humanity are also important carriers of disease. Their control is, therefore, of paramount importance. The insect most responsible for the dissemination of diseases is the common House Fly. These insects spread tuberculosis, typhoid, dysentery, and infantile diarrhoea. It is thus a menace to health.

1935 CALENDAR 1935

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1936 CALENDAR 1936

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● FULL MOON

The secret of control is to destroy the breeding grounds of the House Flies and eliminate all places that serve as an attraction. For this, community co-operation is essential, because such places as a garbage dump, fowl run, or manure heap produce flies that will spread over an area of several miles. All dead animals should be burnt or buried.

MOSQUITOES AND FLEAS.

There are several species of insects that are responsible for considerable discomfort caused by the irritating wounds they make when drawing blood. The commonest of these bloodsuckers are Mosquitoes and Fleas. In regard to Mosquitoes it is fortunate that there are none of the disease-carrying forms (that is, Malaria or Yellow Fever) in South Australia, but this fact is no doubt largely responsible for neglect in any attempt to control the species that are with us. In the vicinity of dwellings Mosquitoes are easily controlled by removing all disused receptacles likely to retain water. In the case of tanks for drinking water, if the manhole or inlet is close fitting no Mosquitoes can enter to lay their eggs, while a little bluestone is sufficient to prevent the insects breeding in water troughs.

Fleas are of many kinds, each having its own particular type of animal. For example, there is a distinct species of Flea peculiar to the domestic fowl, rat, mouse, dog, cat, man, &c., though these Fleas do not hesitate to attack animals other than their own hosts. These insects are extremely active, with powerful jumping legs. Their breeding grounds are mostly the sleeping quarters of the animals they infest, and get into the cracks of floors. Domestic animals should be kept as free from Fleas as possible, and their sleeping quarters cleaned and treated with Creosote. Insectibane is also good.

The floors of fowlhouses can be kept free from Fleas by a dressing of common salt. In many places Spiders, though harmless, have a tendency to congregate and spin their webs in and about dwellings. Sweeping away the webs and spraying with Kerosene Pyretheum to drive off the spiders is about the only remedy, or the removal of both webs and spiders can be accomplished by a vacuum cleaner in one act.

A discussion of household pests would be incomplete without mention of the common Mouse which if left unchecked, can cause as much destruction as the insects already discussed. The most effective way is organised trapping. An excellent bait being a mixture of peanut butter, rolled oats, chopped raisins, and a drop or two of aniseed oil.

A demonstration on cuts of mutton and pork was given at the afternoon session by Mr. T. Phelps, of Kither's, who cut up a sheep in front of the audience and answered many questions about the economical use and preservation of meat.

Delegates attended the Evening Session of the Men's Branches.

(*To be continued.*)

COOKING AND FANCYWORK COMPETITION.

In conjunction with the Annual Social of the Parilla Well Women's and Men's Branches of the Agricultural Bureau, which was held on 20th August, the Women's Branch conducted a Cooking and Fancywork Competition. A record total of 219 entries was received. There was an attendance of approximately 150 members and visitors.

Mr. M. S. Davis (President of the Men's Branch) occupied the chair, and whilst the exhibits were being judged, an enjoyable musical and vocal programme was carried out. Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau) addressed the meeting, and on behalf of the Advisory Board presented to Mr. G. S. Backman a Life Membership Certificate of the Agricultural Bureau.

The following is the list of prize winners:—

JUNIOR SECTION.

Judges—Mesdames C. R. Mattiske, A. Hawthorne, and J. T. Longford, of Pinnaroo.

Iced cake—1st, Miss V. Ireland: 2nd, Miss D. Thiel. Scones—1st, Miss D. Thiel; 2nd, Miss J. Blacksell. Biscuits—1st, Miss Gwen Simpson; 2nd, Miss V. Ireland. Butter—1st, Miss J. Blacksell; 2nd, Miss Edna Pahl. Scalded cream—1st, Miss V. Ireland; 2nd, Miss D. Johnston. Separator cream—1st, Miss J. Blacksell; 2nd, Miss D. Thiel.

FANCY WORK.

Bonnet and bootee—Miss V. Beckman, 1st and 2nd. Vanity set—1st, Miss D. Thiel; 2nd, Misses E. Pahl and A. Billing. Supper cloth—Miss E. Pahl, 1st and 2nd. Crochet d'oyley—1st, Miss Avis McInerney. Guest towel—1st, Miss V. Ireland; 2nd, Miss A. Billing. Pair pillowshams—1st, Miss D. Thiel; 2nd, Miss A. Billing. Knitted jumper—1st, Miss Ireland; 2nd, Miss A. Billing.

Mrs. Napper secured the trophy for most points in adult section and Miss V. Ireland in the junior section.

JAMS, PRESERVES, ETC.

Judges—Mesdames Atze and Phillis and Miss Trowbridge, of Karte.

Preserved fruit—1st, Miss D. Thiel; 2nd, Miss V. Ireland. Three varieties jam—1st, Mrs. Napper; 2nd, Mrs. C. Lloyde. Three varieties jellies—1st, Mrs. Beckman. Chutney—1st, Mrs. Napper. One jar marmalade—1st, Mrs. M. S. Davis; 2nd, Mis Lloyde. Three jars pickles—1st, Mrs. Beckman; 2nd, Mrs. Napper. Tomato sauce—1st, Mrs. Napper; 2nd, Mrs. Blacksell. Butter—1st, Mrs. Lloyde; 2nd, Mrs. Slater. Glass scalded cream—1st, Mrs. Slater; 2nd, Mrs. Venning. Glass separated cream—1st, Mrs. Wurfel; 2nd, Mrs. Slater.

CAKES, ETC.

Judges—Mesdames Johnson and Carmen and Miss Colwill, of Parilla.

Dark fruit cake—1st, Mrs. Blacksell; 2nd, Mrs. Napper. Sultana cake—1st, Mrs. Blacksell; 2nd, Mrs. Ireland. Coffee cake—1st, Mrs. M. S. Davis; 2nd, Mrs. R. J. Billing. Yeast coffee cake—1st, Mrs. Simpson; 2nd, Miss E. Pahl. Ribbon cake - 1st, Mrs. Lloyde; 2nd, Mrs. Beckman. Walnut roll—2nd, Miss Joan Blacksell. Nut and fruit loaf—1st, Mrs. C. Napper; 2nd, Mrs. L. Ireland. Cream puffs—1st, Miss D. Thiel; 2nd, Miss Beckman. Collection puff pastry—1st, Mrs. Napper; 2nd, Mrs. Ireland. Scones—1st, Mrs. Blacksell; 2nd, Mrs. B. Pahl. Biscuits—2nd, Mrs. Ireland. Six different pieces iced cake—2nd, Mrs. Ireland. White sponge—1st, Mrs. B. Pahl; 2nd, Miss J. Blacksell. Brown sponge—1st, Mrs. B. Pahl; 2nd, Mrs. Napper. Six fancy afternoon tea cakes—1st, Mrs. Napper; 2nd, Mrs. Ireland. Small cakes—1st, Mrs. N. Venning; 2nd, Mrs. Napper. Yeast buns—1st, Mrs. R. J. Billing; 2nd, Miss V. Ireland Sausage rolls—1st, Mrs. Beckman; 2nd, Mrs. Slater. Jam tarts—1st, Mrs. Beckman. Bread—1st, Mrs. R. J. Billing; 2nd, Mrs. Slater.

BARLEY

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TELEPHONE: CENTRAL 4855 and 4856.

OTHER REPORTS RECEIVED.

WOMEN'S BRANCHES.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Millicent	16/8/35	11	Paper—Mrs. Redman ...	Miss K. M. Hutcheson
Warcowie	27/8/35	—	Social. Addresses—E. L. Orchard and E. C. Richards	Miss L. G. Martin
Auburn	29/8/35	18	Annual Meeting	Miss L. J. Dennison
Warramboo	30/8/35	13	Question Box	Miss J. P. Patterson
Saddleworth ...	19/8/35	—	Visit to Riverton High School	Miss G. E. Frost
Saddleworth ...	3/9/35	12	Woolwork Display	Miss G. E. Frost
Balumbah......	4/9/35	11	"My Outlook of Life"—Miss C. Riches	Miss H. D. Jericho
Rendelsham ...	4/9/35	13	"Home Made Sweets" .	Mrs. Z. A. Bignell
Wasleys	5/9/35	43	Annual Meeting and Social	Miss G. Harding
Sheoak Log	5/9/35	28	Visit to Gwynne's Nurseries Gawler	Miss K. M. Koch
Pinnaroo	6/9/35	18	"First Aid"—Matron Richards	Miss N. A. Mattiske
Mangalo	14/8/35	—	Concert and Dance	Mrs. F. Coles
Mangalo	4/9/35	14	Annual Meeting	Mrs. F. Coles
Coonawarra	21/8/35	29	Annual Meeting	Mrs. O. Skinner
Georgetown	10/9/35	34	Inaugural Meeting	Miss J. Crawford
Pygery	20/8/35	14	Homestead Meeting at Mrs. J. Foster's residence	Mrs. A. R. Kammermann
Pygery	17/9/35	9	Butter-pressing demonstration, Mrs. G. Duggin	Mrs. A. R. Kammermann
Parilla Well	3/9/35	21	Show Exhibit Arrangements	Mrs. J. E. Johnston
McLaren Vale ..	5/9/35	45	Social Afternoon	Mrs. B. Powell
O'Loughlin	9/9/35	16	Pastry Competition	Mrs. E. Lutz
Pinbong	7/9/35	12	Inaugural Meeting	Miss Doreen Scholz
Tantanoola	11/9/35	14	Sultana Cake Competition	Mrs. G. Altschwager
Kalangadoo	7/9/35	7	Arrangements for Cooking Competition	Mrs. M. Brooks
Mudamuckla ...	12/7/35	7	"Floriculture"—Miss G. Kreusler and Mrs. Kuhlmann	Mrs. C. Kuhlmann
Millicent	20/9/35	9	Pickle and Citrus Fruit Recipes	Miss K. M. Hutcheson
Laura Bay	14/5/35	13	"Uses of Eggs"—Mrs. W. Bowell; "Gardening" Mrs. E. Lowe	Miss T. Barnett
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Boor's Plains ..	5/9/35	18	"Pastry Making"—Mrs. T. A. Stanway	Miss L. Stanway
Morchard	28/8/35	8	"Jam Making"—Mrs. R. F. Brown	Miss F. Brown
Tantanoola	5/6/35	14	Pudding Recipes	Mrs. E. Telfer
Wasleys	4/7/35	22	Recipes and Exhibits ...	Miss J. Braun
Wepowie	1/5/35	15	Conference Arrangements	Miss E. Roocke
Wepowie	29/5/35	9	Recipes	Miss E. Roocke

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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,

Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Angaston, Saturday, February 29th, 1936.
Mundalla, Wednesday, March 4th, 1936.
Mount Pleasant, Thursday, March 19th, 1936.

Fig Wasps.

Seeking information on the supply of fig wasps for Smyrna figs, the Secretary of the Koppio Branch of the Agricultural Bureau has been advised by the Chief Horticultural Instructor (Mr. A. G. Strickland, M.Sc.) that:—

"Supplies of wasps can be obtained from the State Experiment Orchard, Blackwood. The brood from the winter figs emerges in September, and the second brood from the spring figs is available in December.

It would be necessary to maintain a supply of wasps from year to year to have a number of Capri fig trees in the Smyrna fig plantation, as the fig wasp goes through its life cycle three times in a year, and the Capri fig produces three crops of figs for this purpose."

Agricultural Bureau Exhibit, Royal Spring Show, 1936.

The Royal Agricultural Society has set aside the sum of £400 for prize money and organising expenses for displays by Branches of the Agricultural Bureau at the 1936 Show. A first prize of £100 and a second prize of £50, plus a distribution of £250 between competing Branches, are offered. This distribution, which is to assist Branches to meet expenses in organising and staging their exhibits, is to be distributed as follows:—

£50 to each competing Branch which secures 50 per cent. or more of the maximum marks, unless more than five Branches compete, in which case the sum of £250 will be equally divided amongst all competitors. Prize winners share in this allocation.

Entries, which are received subject to the approval of the Society, should be addressed to the Secretary at the earliest convenient opportunity.

The Society reserves the unquestioned right to limit or restrict the number of entries accepted, and to refuse to accept any entry without assigning any reason therefor.

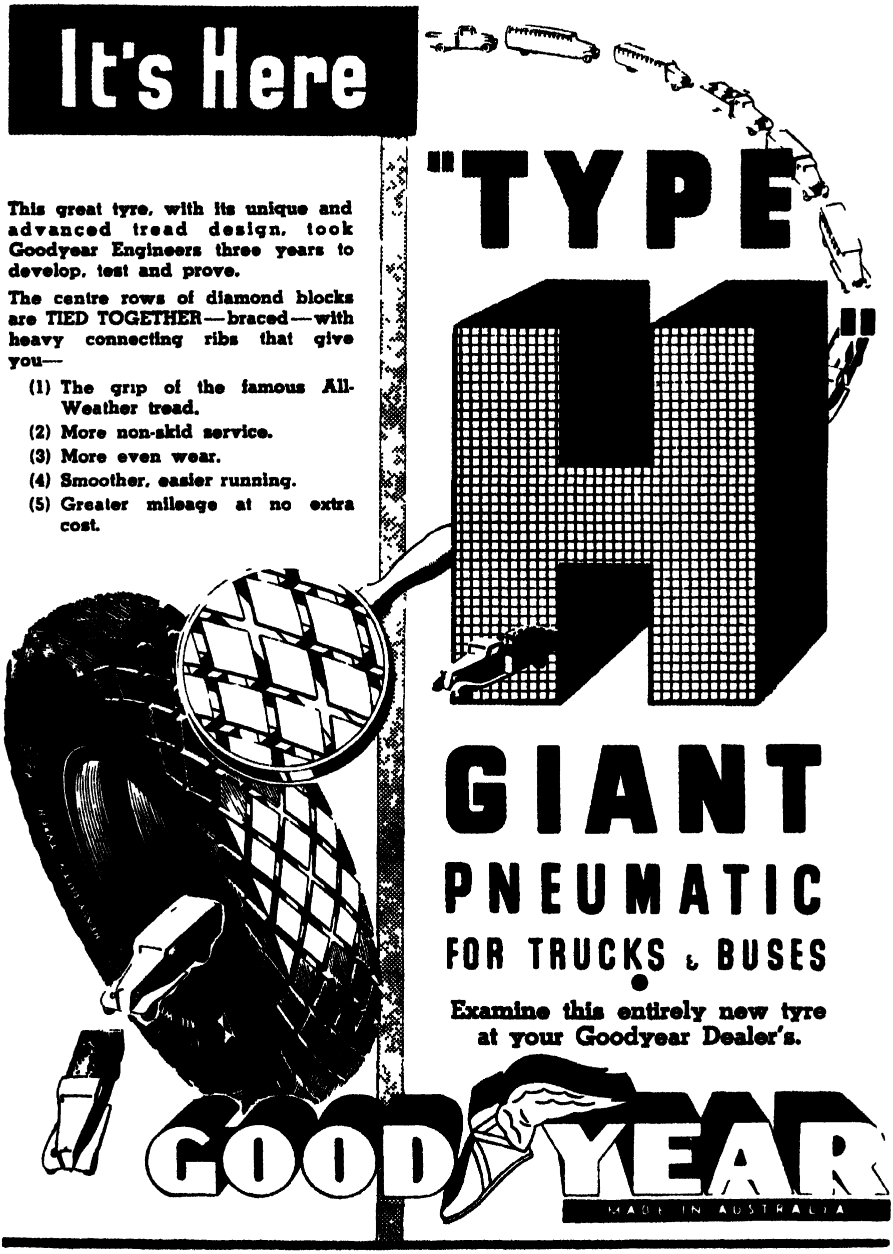
CONDITIONS.

(1) Exhibits may consist of any or all of the articles referred to in the scale of points set out below.

(2) All exhibits must be actually produced and/or manufactured on the farms of members of the competing Branch, excepting that articles manufactured in the district served by the Branch, but not manufactured on the farms of members, may be displayed, but will not be taken into account in judging except under items (12) and (13) of the scale of points.

(3) Exhibits of Wheat, Oats, and Barley must be representative of a bulk of not less than 150bush. of each, and exhibits of chaff and hay representative of not less than 10 tons of each.

(4) All exhibits must be of the current season's growth, except wool, which may be of the preceding year's clip.



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(5) Exhibitors will be required to make a statutory declaration to the effect that the foregoing conditions are complied with in every respect.

(6) *Space.*—The Society will provide a floor space of 45ft. x 15ft. for each exhibit.

(7) No Government institution will be allowed to participate in this competition.

(8) *Staging.*—Exhibits must be staged ready for judging by 9 a.m. on Saturday, 5th September, 1936, and may be removed on Monday, 14th September, 1936, at 9 a.m.

(9) During the progress of judging, it will be necessary for the officer in charge of each exhibit to be in the hall.

SCALE OF POINTS FOR JUDGING.

(1)	Cereals (Grain and in Sheaf)	150
(2)	Hay, Chaff, and Silage	100
(3)	Wool	100
(4)	Dairy Produce, Bacon, Hams, Eggs, Lard, Dripping, &c.	150
(5)	Green Fodders, Grasses, &c.	50
(6)	All other Grains and Seeds	50
(7)	Fruits (Fresh and Preserved), Pickles, Sauces, Jams, and Honey	50
(8)	Vegetables and Roots	50
(9)	Drinks (including Wine)	50
(10)	Produce not otherwise specified	50
(11)	Home-made devices	50
(12)	Effective arrangements	100
(13)	Discretionary points for any outstanding feature not specifically provided for	50
	Total	1,000

Whole Milk Pig-feeding Trial.

In accordance with the wishes of the Hon. Minister, a trial was carried out at Roseworthy Agricultural College to test the relative merits of skim and whole milk for feeding pigs. Actually the trial could not be put on a big enough scale on account of the shortage of whole milk, but as the results are strikingly different the lack of numbers in the experimental pens does not detract greatly from the conclusiveness of the results.

Mr. R. Baker (Dairying Instructor), who conducted the trial, reports as follows:—

"For the purpose of estimating the value of whole milk fed to pigs, a comparison was made in the feeding of whole milk against skim milk, with the basal food crushed wheat.

"The trial was carried out with two pens of Large White x Berkshire weaners. The pens were arranged to provide as near as possible a corresponding initial weight. The quantity of milk fed during the test was in the ratio of 2lbs. of milk to one of crushed wheat on all but two occasions, when the quantity of milk was reduced to a 1 and 1 ratio. The whole milk was standardised to a 4 per cent. butterfat content. The costs of food were estimated on the following prices:—Crushed wheat, 3s. per bushel; whole milk, 6d. per gallon; skim milk, 1d. per gallon. In estimating the cost of food per pound of pork a difference of 30 per cent. has been taken between pork and increase.

"Feeding was continued until the pigs reached a forward pork weight, approximately 120lbs. live."

From this experiment the figures obtained are set out in the attached table.

Conclusion.—The significant feature of the results is that it cost 5.38d. to produce 1lb. of pork when feeding whole milk and wheat, whereas it cost only 2.60d. to produce 1lb. of pork when feeding skim milk and wheat. The conclusion to be drawn from this work is that feeding pigs on whole milk is far too expensive, and is therefore uneconomical. Similar results can be obtained with skim milk at less than half the cost.

THE FEEDING OF PIGS ON WHOLE MILK.

Ration.	Days Fed.	Initial Weight.	Final Weight.	Increase.	Increase. per Day.	Ration.	Quantity of Food Consumed.	Quantity of Food per Day.	Cost of Food per Day.	Quantity of Food per Lb. of Increase.	Cost of Food per Lb. of Increase.	Cost of Food per Lb. of Pork.
		Lbs.	Lbs.	Lbs.	Lbs.		Lbs.	Lbs.	Pence.	Lbs.	Pence.	Pence.
Whole milk, 1;	51	44	127	83	1·62	Whole milk	688	13·50	8·10	4·14	2·484	5·38
and Wheat, 2	—	27	110	83	1·62	and Wheat	356	6·98	4·18	2·14	1·284	—
Total	—	71	237	166	3·24	Total ...	—	—	12·28	—	3·768	—
Skim Milk, 1:	51	40	122	82	1·61	Skim Milk	712	13·96	1·39	4·45	·445	2·60
and Wheat, 2	—	37	115	78	1·53	and Wheat	368	7·21	4·32	2·30	1·380	—
Total	—	77	237	160	3·14	Total ...	—	5·7	5·71	—	1·825	—

Fertiliser Bounty.

Advice has been received from the Prime Minister's Department that under the provisions of the Primary Producers' Relief Bill submitted to the Federal Parliament, £275,000 will be paid to the State Governments for distribution to primary producers, other than wheatgrowers, at the rate of 15s. per ton on fertilisers used during the current financial year. The bounty will be paid on half-ton lots.

Chaffed Barley Straw and Grain v. Wheat or Oaten Straw.

Replying to the Secretary of the Brentwood Branch of the Agricultural Bureau, who asked whether barley straw (Prior) was as nutritious when chaffed and fed with grain, as wheat or oaten straw, Professor Perkins (Director of Agriculture) says:—

"In the first place it must be noted that no straw that has carried well-ripened grain can be looked upon as having much nutritive value for livestock, chiefly because it contains a very high proportion of indigestible fibre; nevertheless, it can be fed in absence of any better material in conjunction with crushed grain or other concentrates. Of the three types of straw mentioned, barley or oaten straw are approximately of the same value from a feed point of view, and wheat straw of less value than either barley or oat straw.

"It can be added, too, that both barley and oaten straw are more readily accepted by livestock than wheat straw."

St. John's Wort.

Replying to a question submitted at the Butler Conference, Mr. R. C. Scott (Supervisor of Experimental Work) stated that the authorities had provision, by means of the Noxious Weeds Act, for the eradication of St. John's Wort where such eradication was economically possible

St. John's Wort was a proclaimed noxious weed in South Australia. The Act was administered by district councils, but if they did not take action, there was provision under which the Local Government Department could compel them to do so. Everything depended upon the extent of the infestation and whether it was a reasonable proposition to attempt destruction. In order to check the spread of St. John's Wort, councils must take action when any new area was discovered. If they failed to do so, the matter should be reported to the Local Government Deparment in the interests of the district as a whole

Other work that had been done to assist in the eradication of St. John's Wort had been a series of experiments with plant poisons Whilst a sodium chlorate solution was effective in destroying this plant, when applied early in the season, the cost was too great to allow for general recommendation. The matter of controlling the pest by insect parasites had been taken up by the Council for Scientific and Industrial Research, and promising results with a species of beetles (*Chrysomela*) had been obtained. In the laboratories these beetles lived entirely on St John's Wort and failed to survive when this plant was finished, notwithstanding the fact that other green stuff was available. The work was being continued, and the result after liberation in the field would be of considerable importance.

Trunk Calls from Multi-Coin Collector Public Telephones.

The Postmaster General's Department has recently installed at various country centres a device known as a Multi-Coin Collector. This device is associated with the public telephone circuit and enables trunk line and other calls to be originated during such times as the local office is closed. There are two types of collectors in use—one is installed at post offices where rural automatic telephone exchange facilities have been established. The offices in South Australia at the present moment are Willunga, Noarlunga, Macclesfield, and Birdwood. The other type, known as the Magneto Multi-Coin Collector, is installed at offices where a manually operated exchange is in use, but where attendance at the exchange is limited to, say, 9 a.m. to 8 p.m. or 9 a.m. to 6 p.m.

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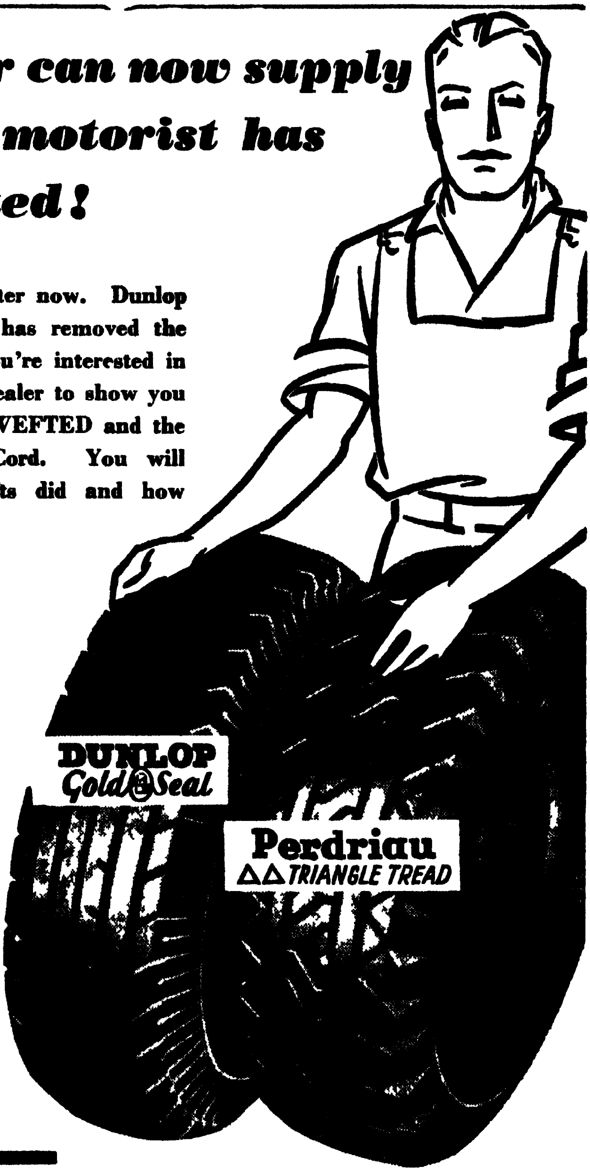

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The coin collecting devices are each provided with three slots—one of which is for shillings, another for sixpences, and a third for pennies.

In the case of those installed in connection with rural automatic exchange facilities two press buttons are provided—one marked "A," and the other marked "B." In the case of the Magneto Multi-Coin devices only one button is provided, *i.e.*, button "B."

The system of operation is briefly as follows:—A person wishing to make a call after hours calls the telephonist at the controlling exchange, which is continuously staffed; he then advises her as to the number he wishes to call and then deposits coins of the necessary denomination to pay for the call in their respective slots. The telephonist checks the number and value of the coins deposited by means of tones heard as the coins drop into the machine. If the call can be connected the telephonist requests the caller, if using the automatic type of telephone, to press button "A." When this button is operated the coins fall into a receptacle provided for them. If the call is ineffective, the telephonist at the control centre will ask the caller to press button "B"; when this button is pressed the coins drop into a chute on the front of the coin collector where they may be recovered by the caller.

In the case of the Magneto Coin Collectors, the depositing key, button "A." is installed at the controlling exchange; this simplifies the use of the instrument by the caller, but with this exception the operation of the two types of instrument is practically identical.

Devices of the Magneto Type have been installed at Port Noarlunga, Reynella, Roseworthy, Greenock, Keyneton, Mundalla, and Echunga, and it is anticipated that similar equipment will be installed at other suitable offices at a later date.

Notice to Tobacco Growers.

Growers of tobacco seedlings are reminded that should they wish to sell plants, they are required by the regulations under the Tobacco Industry Protection Act to notify the Director of Agriculture, as laid down in regulation No. 2, at least four days prior to any sale or disposal of seedlings being made.

Unregistered growers should notify the Department immediately of their intentions.

The following preparation of Home-made Colloidal Copper Solution will be found beneficial in the prevention of the Blue Mould disease:—

A stock solution of this fungicide is first prepared, and is diluted with water for spraying purposes. A grower may consequently make up sufficient concentrated fungicide for two or three months' spraying operations at one time.

Details for the preparation of the stock solution are as follows:—1lb. of bluestone "fines" is first dissolved in 2 quarts of water. The "fines" are preferable to crystals, since they dissolve more readily. The bluestone is best dissolved by suspending it in a bag in water which may be heated to accelerate the process. It should be dissolved in a wooden tub or some non-metallic vessel, since this chemical will react with metals. If tins are the only vessels available, they must first be thoroughly coated with pitch. One pint of molasses is next stirred well into the bluestone solution. The solution is finally made slightly alkaline by the addition of a caustic soda solution prepared by dissolving 5ozs. of caustic soda in a quart of water. The caustic soda solution must be added slowly to the bluestone and molasses mixture, with constant stirring.

The above-mentioned quantities will make up about a gallon of stock solution, and should result in a slightly alkaline spray. The additional precaution of carefully adjusting the reaction of the spray may be carried out in this fashion:—

When almost all the caustic soda solution has been added, transfer a drop of the mixture to a piece of blue litmus paper. The colour of the paper should turn pink. Add more caustic soda solution until, when tested, the mixture will not change the colour of the litmus paper. A drop of the mixture should then be transferred to a piece of pink litmus paper, which will probably not change colour. Then a little more caustic soda solution is added so that eventually pink litmus paper will turn very faintly blue. (Litmus papers may be obtained cheaply from chemists.)

The stock solution so prepared should be stored in bottles or some closed non-metallic container. Since it will improve on ageing, it should not be used until it is about a week old, when the colour will have changed from green to slightly yellow. In the Departmental experiments stock solution was found to be satisfactory even six to thirteen weeks after preparation.

For spraying purposes the stock solution should be vigorously agitated, and 1 part diluted in 30 parts of water, and 0.5 per cent. by weight of potash soft soap added as a spreader.

A formula for preparing about 8 gallons of spray is as follows:—

A.—Stock solution, 1 quart; water, 7 gallons.
B.—Potash soft soap, 6ozs.; water, ½ gallon.

When the soap has been dissolved in the water, which may be heated to save time, solution B is added and well mixed with solution A. It is advisable to pump the spray through the spray pump back into the spray vat for this purpose

Seedlings throughout South Australia are reported to be doing particularly well so far this season. The Department of Agriculture and a number of growers are trying out the Benzol fume treatment for the prevention of Blue Mould. Any information required can be obtained upon application to the Tobacco Instructor at the Department in Adelaide.

Heavy and Green Yolks in Eggs.

Asking for an explanation of the above terms, the Wasleys Branch of the Agriculaural Bureau has been advised by the Government Poultry Expert (Mr. C. F. Anderson) that the terms "heavy" and "green" yolks in eggs are trade descriptions of the contents of the egg as shown when candled.

The heavy yolk refers to the one which appears much denser and darker than the yolk of an ordinary egg, which, although it appears firm, is almost transparent when the egg is broken. The heavy yolk egg will run while the yolk of an ordinary egg will remain firm.

The term "green" refers to the colour of the yolk. On being candled, a percentage of eggs shows a little darkness in the yolk, varying in colour under the light from a light-green to an olive-green yolk. When the eggs are broken, the green colour of the yolk shows up much more prominently.

There is no doubt that with the stricter testing of eggs now being practised, a number of faults are being found which, in previous years when the testing was not so severe, were allowed to pass.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of—

*Bulletin No. 89: "Osiers and Willows," price 9d.
*Bulletin No. 91: "Table Poultry Production," price 1s.

Published by Ministry of Agriculture, England.

World's Grain Exhibition and Conference, Part II.
Rothamsted Experimental Station: Annual Report, 1934, price 2s. 6d. Copies obtainable from the Secretary, Lawes Agricultural Trust, Harpenden, England.

AGRICULTURAL INQUIRIES.

[Replies supplied by W. J. Spafford, Deputy Director of Agriculture.]

Macaroni Wheats.

Alawoona Conference: "What wheats suitable for making macaroni are suitable for growing in low-rainfall areas, and is there a ready market for same?"

Reply—There are only two important Macaroni Wheats in South Australia, namely, Huguenot and Indian Runner, but unfortunately neither of these are really suitable for low-rainfall districts. Other than these, Forel has been tried in many districts of the State, and there are dozens of other varieties grown in small plots. In other countries Macaroni Wheats are looked upon as drought-resistant, as well as being rust-resistant, but to date we have not found one which will give consistently good grain yields without more than the usual amount of rain received in our low-rainfall areas. In any case, there is a limited market only for Macaroni Wheats in Australia, and so the unlimited growth of these wheats cannot be recommended

Pasture Plants and Top-dressing for the Colton District.

"Would top dressing be worth while in the Colton District?"

Reply— Top dressing would prove an economic proposition in the Colton District, but it would be better done in association with the establishment of some pastures, such as Lucerne, or a mixture of King Island Melilot and Wimmera Rye Grass

"How should Lucerne be established in this district?"

Reply—In the sandy portions of the Colton District the area to be seeded to Lucerne should be sown to barley or any one of the cereals which would be harvested for grain. The stubble should on no account be burnt, but if at all heavy, should be grazed to thin it out, care being taken not to remove all of the straw. After the first seeding rain in April or May, a mixture of 5lbs or 6lbs. Lucerne seed and 1cwt. Super should be drilled in to the acre, with a disc drill. In heavier land the Lucerne could be sown in a stubble, but better results should be secured if the land was fallowed for the Lucerne.

"What other pastures could be grown?"

Reply—A mixture of 3lbs King Island Melilot, 6lbs. Wimmera Rye Grass, and 1cwt. Super drilled in to the acre would produce heavy pastures in the Colton District. This should be drilled in during the autumn, and if regularly top-dressed should be permanent. Although both plants are only annuals, they seed themselves down with the certainty that other weeds do.

"How much Super should be used per acre for top-dressing?"

Reply—If good stands of Lucerne or the mixture of Melilot and grass are to be secured, 1cwt. per acre per year should prove a business proposition, but if the top dressing is to be done on natural pasture, 60-70lbs. per acre per year should be sufficient.

"When should the Super be applied?"

Reply—Best results would follow applications of Super to pastures given in the autumn. When there is plenty of growth, green or dry, to hold the fertiliser, it could be applied as early as February, but April would probably be the best time of the year.

Weevils in Farm Buildings.

Mr. R. C. Scott, Supervisor of Experimental Work, has supplied the following replies to questions submitted by the Hartley Branch of the Agricultural Bureau:—

"How to deal with weevils in a stone building with a wooden floor?"

Reply—Weevils are most effectively destroyed in buildings which are not sufficiently airtight to permit fumigation by dusting with copper carbonate powder. This is the same material as is used for the pickling of wheat, and, being of a very fine nature, sifts into the cracks and crevices of the walls, killing the weevils with which it comes in contact.

Super versus Super and Sulphate of Ammonia.

"What would give the better results on stubble ground, 1cwt. Super or ½cwt. Super and ½cwt. Sulphate of Ammonia?"

Reply—Experiments dealing with the use of Sulphate of Ammonia on stubble-sown crops are now in progress, and the result of previous trials appears to indicate that everything depends upon the nature of the pasture or previous crops which the field has carried.

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If the pasture includes a high proportion of leguminous plants, such as Burr Clover, Melilotus, &c., or if a pea crop has been planted recently, there is no need to add Nitrogen in the fertiliser applied with the stubble crop. In any case, the quantity of Super would not be reduced, and as ½cwt. of 3 to 1 mixture only contains 42lbs. of Super, this dressing is not likely to give equal results with a 1cwt. of Super application, even if Sulphate of Ammonia was required.

Feeding Value of Cape Barley.

"Is Californian Cape Barley equal to English Malting Barley for feeding to Pigs?"

Reply—Californian Cape Barley has not been analysed, but is almost sure to be very similar to ordinary Cape Barley in composition. Assuming this to be the case, it would not quite equal English Malting Barley as a foodstuff for pigs. The relative general composition of these two grains is as follows:—

	Malting Barley. Per cent.	Cape Barley. Per cent.
Mineral matter	2.6	4.6
Crude protein	12.0	5.4
Crude fat	2.4	0.6
Fibre	5.0	19.3
Carbohydrate	63.7	56.5

Milling Wheats for the Mallee.

Alawoona Conference: "What are the most suitable wheats of fair milling quality for the district?"

Reply—Of the wheats that should give reasonable returns in this district, and at the same time produce flour of sufficient strength to keep up our name for wheat of fair quality, the following have been proved:—

Ranee is a very hardy variety which will give consistent yields in the district if grown on good fallow, and although the flour of this wheat is not of high strength, it is of fair quality and good colour. This could be the main variety on most farms if good tillage methods are followed.

Gluyas still remains the best very early variety for low rainfall conditions, but is only of fair quality as a flour wheat.

Sword is sufficiently hardy to be a good yielder, and although the strength of its flour is not particularly high, it is good enough and is of a beautiful white colour.

Felix is early enough for the district and produces fair quality flour.

Ford, if sown early on good fallow, will give good yields, and the strength of its flour is really high compared to most South Australian wheats.

HORTICULTURAL INQUIRIES.

[*Replies supplied by* A. G. STRICKLAND, M.Sc., *Chief Horticultural Instructor.*]

Grafting Loquat Trees.

"Clanfield" asks: Because of the damage done by sparrows to loquats, what variety of fruit could these trees be grafted over to?

Reply—Of the common fruits, Quince and Pear are probably most nearly related. Quince is frequently used as a stock for Loquats, but as the following extract from a report by the Manager of the Blackwood Experiment Orchard will indicate, working in the opposite direction is not common. If the Loquat trees are on Quince stock—which is a possibility—reworking to Pears or Quinces would give a combination of Quince roots, Pear or Quince top, with an intermediate piece of Loquat. The behaviour of such a combination is problematical:—

"Grafting Loquat trees with any other variety of fruit has not come within my experience. We have a collection of Loquats worked on Quince stocks, some of which are doing quite well. Since Loquat will do on Quince, Quince might do on Loquat, and as some varieties of Pears will grow on the Quince stock, a Loquat-Quince Pear combination might be possible. The Pear might do directly on the Loquat, though I have never heard of anyone trying such a combination."

It was suggested to the inquirer that an experiment should be tried with the Pear as the fruit likely to do best on a Loquat stock.

Plant-Eating Grubs.

Specimens of insects submitted by the Blyth Branch of the Agricultural Bureau were reported to be doing extensive damage in farm gardens. These were identified as "Millipedes."

Reply—These animals are closely allied to insects, but differ from them in many respects, notably as regards possession of two pairs of legs to each segment of the body. The food of millipedes is almost entirely of a vegetable nature, either living or dead. They are commonly found in manure, leaf mould, garden rubbish, &c., and are difficult to control.

It has been claimed that a heavy application of lime, thoroughly worked into the soil, will assist in their control; also various soil fumigants such as paradichlorbenzene (usually known as P.D.B.), crude naphthalene, &c., applied to the soil and worked in, have in some instances given temporary check to the pest.

Paradichlorbenezene may be obtained from city suppliers, and one firm also handles a product known as "Seekay" soil fumigant, which may be useful.

When sowing peas or beans, if the seed is well dusted with superphosphate before covering with soil, the Millipedes will probably not attack such seed so readily. Furthermore, the superphosphate will assist the growth of the pea or bean plants.

Plum Tree Dropping Immature Fruits.

The Secretary of the Sutherlands Agricultural Bureau has an almond tree on to which has been grafted apricot and plum. The apricot carries the fruit to maturity, but the fruit of the plum drops off when about the size of a marble.

Reply—There are several factors which may cause plums to drop from the tree at the stage mentioned in this query. However, in view of the isolation of this tree from other plum trees, it is practically certain that the dropping is due to lack of cross-pollination.

Many varieties of plum will not set or carry fruit to maturity unless the blooms are fertilised by pollen from another suitable variety of plum: such process is termed cross-pollination. In order to ensure fruiting of the limb in question, graft on the tree another suitable plum variety, the blooming period of which overlaps with the blooming period of the plum variety already worked on the tree. With such provision, bees and other insects will exchange pollen between blooms of the two plum varieties, and thus enable fruit to be carried to maturity.

Without information as to the variety of plum already attached to the tree, one cannot make a suggestion as to the identity of the new variety to be attached. However, if the inquirer will prepare during next blooming season a bouquet of blossom of a different plum variety, blooming simultaneously with the one in question, immerse such bouquet in a vessel of water, and place in close proximity to the tree, he would be able to determine for himself whether the bouquet variety would be suitable as a pollenizer. If the name of the plum variety is known, advice as to its identity may enable me to suggest a suitable pollenizer.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers of the Stock and Brands Department.]

Secretary, Agricultural Bureau, Appila, asks for particulars for dehorning cattle.

Reply—The ideal time to dehorn cattle is before the calf is 5 days old. Clip the horns around the base of the buttons, slightly moisten the end of a stick of caustic potash, and rub for about a quarter of a minute the tip of each horn alternately, until a red spot shows in the centre of the horn bud; this will be in about five minutes. Care should be taken to rub the centre of the horn and not the sides, also not to have the stick of caustic too moist, for it runs on to the skin and a troublesome sore will result. Wrap a piece of brown paper around the stick to protect the fingers.

Secretary, Arthurton Agricultural Bureau, reports young pigs losing the use of their hind legs.

Reply—Apart from spinal injuries (which are comparatively rare) the most common cause of this condition is a lack of Vitamin A in the foodstuffs supplied. Vitamin A is a substance which is present in cream, fish oils, and carrots. The following treatment of affected animals is recommended:—If possible supply some whole milk in addition to cereals and if this is not possible, give one dessertpoon of cod liver oil twice a day, mixed with the food to each pig for at least 14 days. Early maturing pigs are more liable to be affected owing to the rapid rate of growth, and it is necessary to see that they are supplied with flesh and bone forming foods, such as crushed peas, meat meal, etc. The following mineral mixture also should be provided, and the pigs allowed free access to it:—Sweet bone meal, 10lbs.; charcoal, 10lbs.; common salt, 1lb. Mix thoroughly and place in a cut down tin or some such receptacle.

"Hoyleton" reports 12 year old mare, stiff gait and swelling behind brisket.

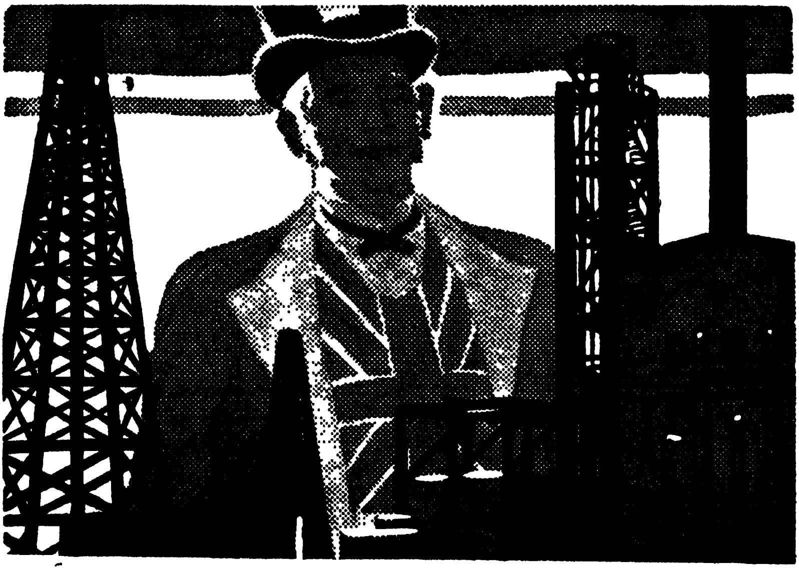
Reply—The following treatment is suggested:—Supplement the green feed with a little chaff, bran, and crushed oats. Also give a daily allowance of 1-1½ pts. of molasses, which should be diluted with water and used to damp the feed. Give the animal 1 teaspoon of powdered sulphate of iron, night and morning for a fortnight. It will probably be necessary to mix the dose with a little honey or molasses to make a paste which can then be placed on the animal's back teeth and tongue. Give half an hour after feeding.

"Koppio" asks is it permissible to mark sheep with numerals for flock marks in other coloured paint than that stipulated for a registered brand?

Reply—The owner of a registered sheep brand may use any of the numerals from 2 to 9 in any colour paint or position without registration, provided that only one numeral is used on any one sheep by each owner. It does not follow that, because the registered brand is in black paint, the numeral must be of the same colour. If he so desires, the owner may use different numerals, colours, and positions for flock marking.

"Borrika" reports lambs 6 weeks old, stiff in limbs after tailing.

Reply—The trouble appears to be that form of arthritis (infection of the joints) which is not uncommonly seen in lambs, not only in this State, but elsewhere, caused by an infection being contracted either through the navel at the time of birth of the lamb, or through wounds inflicted during "marking" operations. In the great majority of cases, recovery takes place within a week or two, leaving the animals apparently none the worse. Some few cases may become chronic, with enlargement of the limb joints. It is not known under what conditions you conduct your lamb-marking operations, *i.e.*, whether you use the same permanent yard year after year for doing this work, or not. If you do, it would be advisable in future years to minimise the chances of repetition of this trouble by carrying out these operations in temporary yards erected with hurdles on some fresh piece of your pastures, at the same time continuing to give the closest possible attention to disinfection of marking knives, other instruments, and workers' hands, etc.



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THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

FORTY-SIXTH ANNUAL CONGRESS.

The seating of the Way Hall was taxed to its utmost to accommodate the record crowd of delegates and visitors who attended the first session of the 46th Congress of the Agricultural Bureau of South Australia which was opened by His Excellency the Governor, Major-General Sir Winston Dugan, K.C.M.G., C.B., D.S.O., on Monday, 16th September, at 8 p.m. The Hon. A. L. McEwin, M.L.C. (Chairman of the Advisory Board of Agriculture), presided and accompanying him on the platform were Messrs. J. W. Sandford (Vice-Chairman), Hon. A. P. Blesing, M.L.C. (Minister of Agriculture), A. J. Cooke, R. H. Martin, S. Shepherd, A. J. A. Koch, P. J. Baily, A. M. Dawkins, G. Jeffrey, F. Coleman, Professor A. J. Perkins, Dr. A. E. V. Richardson (Members Advisory Board of Agriculture), C. C. Crane (Organising Secretary of the New South Wales Agricultural Bureau), and officers of the Department of Agriculture.

ATTENDANCE OF DELEGATES.

The following delegates were appointed by their respective Branches and the figures indicate the number of sessions for which attendance cards were recorded:—

Adelaide: J. Y. Hudd 2, O. G. Ayton 1. **Alawoona:** P. Paull 6, A. J. Pengilly 6. **Aldinga:** G. Sherriff 2, H. L. Stanfield 1. **Allendale East:** R. T. Laslett 5, C. N. Wallace 5. **Arthurton:** D. Noble 4, P. Ford 2. **Balaklava:** R. Shepherd 0, G. Whiting 0. **Balhannah:** H. Rollbusch 5, R. James 2. **Balumbah:** T. N. Wright 2. **Barmera:** V. Shepherd 0, W. MacGillivray 2. **Baroota:** S. G. Stone 2, W. H. Spencer 4. **Beetaloo Valley:** J. Bugg 6. **Belvidere:** J. W. Collett 0, J. Vivian 0. **Berri:** E. J. Johnson 5, G. T. Wilkinson 5. **Blackheath:** H. Paech 5. **Black Springs:** J. Heinrich 5, P. Abbott 6. **Blackwood:** J. Turner 0, H. Goldsack 0. **Block E:** H. Newstead 2, R. Fisher 2. **Blyth:** R. H. Eime 3, H. A. Zweck 4. **Booborowie:** H. Phillips 2, W. Kain 0. **Booleroo Centre:** V. S. Whibley 4, W. A. Mills 5. **Boor's Plains:** A. Reid 2, C. Rodda 2. **Brimpton Lake:** E. Ashmann 5, M. Dunstan 4. **Brinkley:** C. H. Pearson 3, H. D. Humphrey 0. **Brownlow:** G. Biar 0, R. Smith 0. **Buchanan:** W. G. Hucks 2, L. V. Bell 0. **Bundaleer Springs:** M. J. Cronin 3, C. Cooper 4. **Bute:** M. Green 0, T. H. Trengrove 0. **Butler:** C. S. Coleman 5, D. B. Butler 5. **Caliph:** W. H. Todd 2. **Chandada:** R. R. Loveday 3, H. J. Chewings 2. **Chapman's Boor:** C. J. Menadue 4, J. P. Krollig 0. **Chilpuddie Rock:** H. A. Cochrane 6, H. Frost 5. **Coomandook:** M. F. Ballard 3, J. C. Wilson 4. **Coonalpyn:** C. C. George 5, G. E. Venning 3. **Coonawarra:** K. Allder 4, R. Modistach 4. **Cummins:** K. A. Trigg 5. **Cungena:** H. R. Patterson 4, D. R. Bennie 3. **Dudley:** D. I. Telfer 3, L. A. Longbottom 0. **Echunga:** L. H. Walters 4, C. McDonald 5. **Eurelia:** C. I. Phillis 3, F. Stainer 5. **Frayville:** H. B. Scheer 3. **Gawler River:** F. Wormald 2, K. F. Roediger 0. **Gladstone:** L. J. Sargent 4, H. M. Wehr 0. **Goode:** C. P. Linke 5, K. Mundy 4. **Greenock:** T. W. Roennfeldt 2, A. Nenke 6. **Green Patch:** C. L. Whillas 3, L. Darrington 4. **Gumeracha:** W. L. Hanna 2, R. G. Almond 0. **Han:** L. Turner 4, W. Woolacott, jun., 5. **Hope Forest:** H. J. Hunter 4, S. Coad 4. **Inman Valley:** S. F. Hacklin 3, W. F. Roads 0. **Jamestown:** A. J. Symonds 4, A. N. Sandercock 4. **Kalangadoo:** W. J. Hemmings, jun., 5, R. G. Messenger 4. **Kanni:** L. L. Schulz 3, F. J. Neidick 3. **Karte:**

A. A. Bierworth 4, D. R. Freeman 4. **Ki Ki:** O. Blucher 6, R. C. Cooley 0. **Kilkerran:** F. H. Koch 4 **Kelly:** J. F Hannan 5, R. F. Mayfield 4. **Koolunga:** A. Buchanan 5, J. W. Sykes 0. **Koonunga:** R. Schulz 5. **Koppio:** F. G. Gardner 6. **Kyancutta:** T. A. Holman 5, W. Little 4. **Kybybolite:** J. M. Wray 5. **Laura:** E. T. Hollitt 6, H. R. Lines 5. **Laura Bay:** A. M. Dixon 5, F. Edson 5. **Light's Pass:** F. W. Boehm 4, F. Boehm 4. **Lone Gum and Monash:** R. P. Telfer 3, H. March 1. **Lyndoch:** E. N. Evans 5. **MacGillivray:** E. C. Seager 5, J. N. Wood 3. **Maltee:** V. B. Schwarz 5, M. Martin 3. **Mangalo:** R. J. Turner 3, W. F. Munday 6. **Marama:** W. S. Gray 4, H. L. Whitford 5. **McLaren Flat:** G. Dowdell 3, K. Warren 0. **Millicent:** A. Sapiatzer 5, R. Hateley 5. **Miltalie:** D. P. Bagnell 4, S. D. Ramsey 3. **Minnipa:** G. Potts 3, B. C. Black 4. **Monarto South:** H. A. Hein 6, C. F. Altmann 0. **Moorook:** L. A. King 4, L. W. King 3. **Morchard:** A. I. McCallum 0, E. Tilbrook 0. **Mount Barker:** H. Hunt 2, S. Lucy 2. **Mount Bryan:** H. H. Edwards 4, A. A. Jeffries 5. **Mount Gambier:** L. Barrows 5, J. E. Morphett 4. **Mount Hope:** J. H. Vigar 4, H. H. Myers 5. **Mount Pleasant:** J. H. Buckley 0, W. K. Johns 3. **Mudamuckla:** W. J. Reincke 6, A. C. Watson 5. **Mundalla:** W. F. Golding 6. **Murray Bridge:** A. Wells 5, B. Kuchel 0. **Murraytown:** E. B. Pitman 6. **Myponga:** R. C. West 1 C. A. Martin 0. **Nantawarra:** S. V. Herbert 5, M. P. Hamdorf 5. **Narridy:** E. W. Richards 4. **Nelshaby:** F. Jose 4, H. Williams 4. **Nunjikompita:** R. Dunn 4, H. J. Salmon 6. **O'Loughlin:** A. Kloeden 5, C. Bergmann 5. **Owen:** W. J. Marshman 1, A. N. Freebairn 3. **Palabie:** R. Mullan 5, D. Swanson 4. **Parilla:** H. G. Johnston 6, C. S. Foale 5. **Parilla Well:** P. McInerney 5, L. Ireland 4. **Parrakie:** A. Afford 4, F. H. Gravestocks 4. **Paskeville:** H. M. Meier 4, J. Prouse 4. **Penola:** E. Kidman 2, E. R. Hinze 6. **Penwortham:** J. R. Hackett 4, A. T. Duke 0. **Petina:** H. H. Howard 5, W. L. Schultz 5. **Pinbong:** H. B. Scholz 5, E. M. Scholz 5. **Pinkawillinie:** W. G. Miller 0, F. T. Freeth 0. **Pinnaroo:** A. T. Hawthorne 5, C. H. Ross 6. **Port Elliott:** J. Colebatch 2, W. Bennett 4. **Pygery:** D. Ingram 5, H. Woodrup 4. **Red Hill:** J. Dundon 4, L. Harris 5. **Rendelsham:** F. R. White 4, W. H. Bignell 5. **Roberts and Verran:** F. Masters 5. **Rosedale:** C. Mattiske 0, A. Muegge 3. **Roseworthy:** J. Carmichael 5, E. T. Oates 1. **Saddleworth:** W. O. Coleman 4, R. E. Miller 3. **Shoal Bay:** G. Barrett 5, A. G. Nash 4. **Snowtown:** A. R. Hocking 0. **Stockport:** F. Watts 3, R. Koch 0. **Sutherlands:** V. H. Weiss 5, E. Twartz 5. **Tantanoola:** G. W. Altschwager 4, M. Telfer 5. **Taplan:** W. J. Hammond 5, P. R. Hodge 0. **Taragoro:** T. Winters 4, E. M. James 2. **Tarlee:** N. L. Clarke 0. **Tatiara:** F. Densley 6, L. H. Butler 6. **Ungarra:** F. D. Butler 3, W. Gordon 4. **Upper Wakefield:** C. Roberts 3. **Wallala:** J. Kinnane 0, S. Morgan 5. **Wandearah:** E. Sinclair 0, A. Jacobs 4. **Warcowie:** F. L. Williams 3, B. E. Telfer 5. **Warramboo:** H. F. Chilman 4, O. J. Murphy 5. **Wasleys:** O. A. Benger 5, V. W. Day 3. **Watervale:** J. W. Baillie 5, W. Hamp 6. **Weavers:** E H. Giles 5, H. W. Cornish 3. **Wepowie:** M. J. Gregurke 3, J. F. Burns 6. **Whitwarta:** J. P. Hoepner 4, F. J. Collins 2. **Willowie:** R A. Barrie 4, R. I. Crisp 5. **Wilmington:** P. C. Cole 3, D. McGhee 6 **Wirrabara:** A. B. Curtis 5, H. C. Jaeschke 0. **Wirrilla:** R. F. Kelly 4, A. L. Sandow 0. **Wolseley:** D. G. Butler 5, W. J. Snoad 6. **Wudinna:** C. A. Newbon 4, W. P. Bartley 6. **Yeelanna:** R. R. Wilson 5, G. G. Pearson 2. **Yundi:** W. Sykes 4, W. Hedger 4. **Yurgo:** E. A. Easton 4, L. S. Hopgood 5.

OPENING ADDRESS.

In the course of the opening address His Excellency said that he was pleased to see so many smiling faces, which showed him that a wave of optimism had set in, and that they were looking forward to the future with a greater measure of hope than in the past. "Before I came to South Australia," said the Governor, "I was not an agriculturalist. To-night I can say that I am. I have taken the greatest interest in the agricultural life of the State, and I have found to my great pleasure that there is no portion of the community that can be relied upon to produce greater happiness than the agriculturalists."

The Governor referred with pleasure to the recent beneficial rains that had fallen in South Australia.

Round the Corner.

"Nobody can fail to be impressed with the fact that we are really round the corner as far as prosperity is concerned" he said. "Some people will say that there is no hope—you will always find that kind. But we should do away with those ideas; we should put behind us the days of depression, and look forward to the future with greater hope, and remember what the pioneers did, despite the dark days of the past.

"Do not take much notice of pessimists. I want to ask you to look forward to the future with that spirit of hope that sent forward our pioneers towards prosperity and the improvement of our State. I hope that in another year's time I will see you smiling even more broadly."

Bulwark of State.

In reply to a vote of thanks, moved by Mr. J. Wallace Sandford, and seconded by Mr. S. Shepherd, the Governor said, cheerfully: "I would ask you not to take too much notice of all you hear about me. I know I have a reputation for some things, but whatever it is, I am heart and soul in favour of the people in the country, and regard them as the principal bulwark on which the State rests."

THE MINISTER'S ADDRESS.

The Hon. A. P. Blesing, M.L.C. (Minister of Agriculture), in addressing the assembly, congratulated the organisation on its 46th Congress, which represented 337 Branches, including 52 Women's Branches, and an aggregate of nearly 7,000 members.

The Agricultural Bureau system had a very firm grip on the producing interests of the State, both from the standpoint of the technique of production and from that of social intercourse; in the latter direction the Women's Branches, which were increasing very rapidly, had much to commend them.

From the technical standpoint the Country Branches of the Bureau represented so many links between producers and the officers of the Department of Agriculture, and between them had contributed much to the progress and development of South Australian farming.

On the whole, the season appeared to be promising for the State; it was regrettable that this could not be said of every district. Unfortunately, the prospects of the Upper North and North-Eastern Mallee farms were far from good; in particular, those situated outside Goyder's line of rainfall.

In this connection, Government would probably have to consider in the near future the problem of those Hundreds that in the past 20 years had not averaged more than 5bush. or 6bush. per acre. It did not seem possible that such farms should be able to pay their way even with the doubtful assistance of side lines. It would be very much better for all concerned if such doubtful wheat holdings could be gradually converted into sheep farms—not sheep stations.

The Wheat Position.

For the past seven years mean prices realised for wheat had given considerable concern and compelled the Commonwealth Government to come repeatedly to the rescue of farmers, and, unfortunately, over the majority of these seasons, weather conditions had not been favourable. It was, however, permissible to-day to sound a more optimistic note. It could, in fact, be said that from the statistical standpoint the position had never been better since the 1927-1928 season, when the average price realised for wheat in South Australia was 5s. 5¼d. per bushel at seaports.

The main cause of the seven-year slump in prices was the heavy carry-over of stocks of exportable wheats from one season to another and this accumulation of stocks had in the main been attributable to increased production both in normally exporting countries and in normally importing countries, on the one hand, and to the apparent reduced demand in many countries that had previously been heavy consumers of wheat, on the other.

Fortunately, the carry-over on 1st August, 1935, was the lowest recorded since 1927-28, namely, approximately 310 million bushels, as against 598 million bushels in 1933-1934 and 625 million bushels (a record) in 1932-1933. These reductions were in the main due to the successive misfortunes of the United States of America farmers, but also to reduced production in most other countries.

In addition, United States of America 1935 crops were again reported to be below normal; nor were crops of other producing countries as good as of recent years.

The price of wheat had already begun to rise, and should continue to do so unless unforeseen world conditions supervened.

Milling Qualities of Wheat.

Much had been said of recent years as to the decline in quality of Australian wheats, and steps had been taken in South Australia to counteract it. A committee had been appointed to deal with the whole question. On this committee were represented:—

1. The Wheat Merchants,
2. The Millers,
3. The Bakers,
4. The Department of Chemistry,
5. The Waite Research Institute,
6. The Roseworthy Agricultural College, and
7. The Department of Agriculture.

One of the first steps the committee had taken was to urge that the following wheat varieties should no longer be grown in South Australia:—

1. Free Gallipoli.
2. Gluclub.
3. Ghurka.
4. Waratah.

It was hoped that farmers would take note of this urgent request, as in all probability wheat buyers would dock those wheats heavily in the 1936-1937 season.

The Agricultural College and the Waite Institute were doing good work in studying the problem of producing new varieties suitable to various districts, which would be satisfactory from the standpoints of yields per acre, quality of flour, and resistance to disease. Officers of the Department of Agriculture would assist in extending the use of any good wheats that might be bred.

It was well known that Parliament passed last year the Noxious Insects Act, 1934, to deal with the control of migrating grasshoppers. The Act placed the responsibility of dealing with this pest upon the district councils, and through them upon individual landowners. The Government had appointed a special committee to study the matter, and it would continue its work in years when the agricultural areas were free from the pest. This committee would, at all times, assist councils and landholders with advice. The Government recognised that in extreme cases it might have to step in with temporary financial assistance, but it expected the councils to take up the work themselves in the first instance. Some very good work was done by several councils last year.

Parliament also passed last year the Dairy Produce Act, 1934, which had rendered possible a home price for butter and cheese in South Australia. This had meant, as shown by the Dairy Produce Board, that cream suppliers had benefited to the extent of 3½d. per lb. of butterfat in comparison with normal London parity values obtaining over the six months ending on the 30th June, 1934. Makers of farm butter whose butter was of satisfactory quality had also benefited from the higher prices for butter which had ruled on South Australian markets.

THE CHAIRMAN'S ANNUAL REPORT.

The Hon. A. L. McEwin (Chairman) read the following report:—

"It is my privilege to give to this Congress a report on some of the activities of the Advisory Board of Agriculture during the past 12 months. In the course of a year's work the Board has occasion to deal with a very lengthy and a much-varied list of items submitted to it by Conferences and Branches. Many of these items are of purely local application; some of them have national aspirations and others apply to the State as a whole. Careful consideration is given to all, and they are dealt with in the light of the experience of our members who represent important rural industries.

There has not been any change in the personnel of the Board since we met in 1934. On 30th June last the number of Branches was 337, with a total membership of 7,000, which is regarded as a satisfactory roll, and it is pleasing to report that in some districts there has been renewed activity in Bureau work, attended by increased membership in many instances and the consequent better roll-calls at meetings.

We welcome Mr. Shepherd back to the work of the Board after his trip overseas. Mr. Shepherd has given us some valuable information on the agricultural conditions as he found them in the countries he visited, and Branches in the South-East have been particularly fortunate in having the opportunity of hearing his addresses. We desire, too, to extend congratulations to Mr. Shepherd upon receiving the distinction of Life Membership of the Bureau for the very valuable work he has done for the organisation over a period of 22 years.

In order to ascertain the extent of agricultural progress in those parts of the Southern Hemisphere with which we are competing and to inquire into the possibility of applying their methods to our conditions, the Board made a strong recommendation that Mr. W. J. Spafford, Deputy Director of Agriculture, should visit these countries. Mr. Spafford has completed the tour, and the Board shares the confidence of the farming community that the result of this tour will be of immeasurable benefit to the State. The first instalment of Mr. Spafford's report will appear in the September issue of the *Journal*, and it will no doubt be closely read and studied by all who are in any way interested in the progress of our agricultural practices.

At the Blyth Conference in March last Mr. R. H. Eime read a paper on the "Management and Care of the Farm Team." Upon reading this article in the *Journal* His Excellency the Governor commended Mr. Eime on the thoughtful paper he had prepared and asked him to follow it with another on the "Care of Harness." We congratulate Mr. Eime most sincerely for the distinction which His Excellency has thus bestowed upon him and the paper on the "Care of Harness" has been accepted for the Agenda of this Congress.

In order to meet the repeated requests for advice on wool-classing the South Australian School of Mines has made the services of Mr. Goddard available for demonstrations and lectures for several months during the year. These demonstrations have been very popular, and it is hoped that the arrangement will be continued so that every Branch throughout the State will eventually be visited.

While we are aware that the Minister is fully sympathetic towards the extension of instructional work in veterinary hygiene, it is regretted that we have so far not been successful in obtaining the assistance which Bureaux have sought in the proposed appointment of Veterinary Officers to country districts. We appreciate, however, the establishment of Veterinary Scholarships through which suitable young men are assisted in obtaining their degree in Veterinary Science in the Sydney University. It is hoped that the scheme will be extended so that we may eventually have some guarantee that a qualified veterinarian will be forthcoming each year, and that we will have the benefit of his services in parts of the State where they are most needed. In the meantime, support is being given to the establishment of Veterinary Lodges, which are serving a most useful purpose in many districts.

It will be noted that the Government introduced a Bill during the present Parliamentary Session to bring about the registration of Veterinary Surgeons, and this Bill is at present before the House.

Many discussions have taken place on the important question of improving the milling qualities of wheats. The Millers' Produce Company is giving valuable assistance in this matter by donating a special prize in each District Competition for the highest points secured by crops consisting of varieties other than certain excepted wheats. It is expected by this means to bring greater concentration on the necessity for improving the State's standard of quality.

During the year the Board was asked to express its opinion on a resolution of the New South Wales Farmers' and Settlers' Association, that all wheat bags manufactured in Australia be of the Chapman standard. It was agreed that the standard should be enforced, and a suggestion was made that a bag of wheat, conforming to the standard size, should be accepted for handling irrespective of the total weight.

On several occasions the Board communicated with manufacturers in respect to the price of superphosphate, and it is gratifying to note that there has been a substantial reduction in the price of this commodity.

In view of the large amount of money spent on the reclaimed areas of the Murray Swamps, and of the comparatively small returns, the Board is endeavouring to obtain the full-time services of an Agricultural Adviser to that district.

Questions relating to the Branding of Sheep were brought before the Kyancutta Conference. An opportunity has now been taken to give the fullest information on the provisions of the new Brands Act.

Special attention has recently been drawn to the extensive damage done by Skeleton Weed to wheat-growing lands in New South Wales. It is fortunate, however, that the weed has not made its appearance in this State. The Board has arranged for an article on this weed, by Mr. G. H. Clarke, to be published in the September issue of the *Journal*, in order that farmers will have some means of identifying it in case it shows up here. Members of Branches should be in constant watch for this weed, and as a precaution they should forward a specimen of any unknown plants to the General Secretary for identification.

On various occasions the Board has given its support to the establishment of a Pig Condemnation Fund, and we have been informed by the Minister that the matter would again receive the consideration of Cabinet.

The Dairy Cattle Compensation Fund recommended by the Mount Barker Conference is still under consideration. It is proposed to give attention to the possibility of securing the co-operation of other organisations in this matter.

The Board gave its support to the Mount Barker Conference resolution asking that for the protection of the Dairying Industry, action should be taken to enforce a levy on all butter substitutes manufactured in competition with the dairy butter. At a Conference held at Canberra it was recommended that margarine and margarine-like substances made from imported oil be marketed in white colour, and if this was adopted it was not proposed to impose a duty on margarine. The Minister has intimated that consideration would be given to the introduction of legislation to deal with the matter.

In replying to a request from the Upper North Conference that farmers be allowed to co-operate in transporting livestock to the Metropolitan Abattoirs, the Transport Control Board intimated that with a view to assisting primary producers, special permits were readily issued for the carriage of lambs, pigs, and calves over controlled routes.

In regard to the Sales Tax on oils used for agricultural machinery, the Prime Minister informed the Premier that the Board's request had been listed for the consideration of the Federal Government when in a position to grant any sales tax remissions. It will be noted that this matter will be again brought before this Congress on Wednesday morning.

Special attention has been given by the Government to the Board's request for better water reticulation on Eyre's Peninsula. The main Departmental difficulty is the question of supply, and steps are being taken to increase the catchment, after which it is anticipated that there will be an extension of service.

The articles by Mr. George Quinn on the results of the Blackwood Experimental Orchard are of special interest to fruit-growers. Various Conferences had requested that the results of this Orchard be made known for the benefit of growers, and the articles which are now being published in the *Journal* are characteristic of Mr. Quinn's thoroughness and will no doubt prove of great value to the fruit industry.

Further attention has been given to the question of cause and control of Gummosis and a request has been made for continued investigations by the Waite Institute in co-operation with the Department of Agriculture.

In response to a resolution of the Fruit Conference held at Balhannah the Chief Horticultural Instructor has intimated that he will explore the possibilities of establishing a demonstrational plot with the object of conducting experiments in ploughing of orchards.

Many other items submitted by Branches either through Congress, Conferences, or meetings have been before the Board and brought under the notice of responsible authorities for attention.

The Pruning Competitions continue to be well patronised by Branches. These Competitions are held along the River Murray, in the Lower North, and in the McLaren Flat district. The Branches in these areas have been particularly fortunate in obtaining the continued support of the Royal Agricultural Society, the Dried Fruits Association, and of Mr. W. Langdon Parsons. The encouragement given by these donors of trophies certainly stimulates the Competitions, which are recognised as having a decided influence on the pruning practices applying to the districts concerned.

Following the praiseworthy efforts of the Light's Pass and Angaston Branches of a few seasons ago in experimenting with methods of combating frosts it is noteworthy that further work in this connection has been done by the Waikerie Branch. It is reported that through the organised effort on the part of members, a recent frost was successfully avoided, and the methods adopted could no doubt be applied with benefit in other districts where frosts are a menace to growers.

The interest in the work of Women's Branches throughout the year has been little short of phenomenal. The first Women's Branch was formed at Riverton in 1917, but there did not appear to be a desire on the part of any other district to join this movement until three years later, when the second Branch was formed at Saddleworth. Very few additional Branches were established until 1929, when the organisation became more popular among country women, and we find that to-day there are 52 Branches, and with only one exception they are active and are generally living up to the ideals upon which the Bureau was originally founded. An outstanding feature of the work of Women's Branches is the effect they have on the work of Men's Branches. Definite improvement in attendances at Men's Branches has been noticed in most instances where there are corresponding Women's Branches. The practice adopted in several districts of having meetings of both Branches at the same time has had a marked influence on the Men's Branches, and especially is this the case where a social evening follows the business meetings.

A glance at the Agenda for the Women's Congress will give an indication of the extent to which we call upon outside sources to assist in providing papers and demonstrations on subjects in which country womenfolk are particularly interested. The Board extends its sincerest thanks to all who are assisting in this way. On many occasions during the year Women's Branches have again been ably assisted —through the courtesy of the Director of Education—by Miss Campbell, who has attended meetings and Conferences and has given Wireless Talks on the general activities of the Bureau in districts where Women's Branches exist. These talks are an innovation suggested by the 1934 Women's Congress and will undoubtedly be the means of stimulating the work of the Bureau in many ways.

As there is a large assemblage of members here to-night it is an opportune moment to express publicly the Board's appreciation of the work of Branch Secretaries. As a general rule, the secretary is the main executive officer of the local Bureau, and the successful working of his Branch largely depends upon the attitude he adopts towards the office which he holds. We are justified in claiming that our organisation has been successful, and that it has had a marked influence on our agricultural practices. Similarly, we are justified in affirming that much of the credit for this is due to the work of our Secretaries. Their work is of an honorary nature; they have many duties to perform, some of which are arduous, some pleasant, and some may, at times, be irksome. They take the good with the bad with the one object of showing results which will be of use to their fellow-members. It is our duty, therefore, to give public recognition of their services, and to thank them for the manner in which they are assisting the organisation throughout the State.

The Board has had the fullest co-operation of the Department of Agriculture, and we appreciate very highly the assistance which the officers of the Department have given to Branches in particular. These officers are always prepared, wherever possible, to attend meetings, to give addresses or demonstrations, to attend field days and to keep in close touch with Branch members. Very often their work involves personal inconvenience, to which they are prepared to submit for the successful performance of their duty and for the welfare of the farming community. They take an active interest in competitions organised by Branches, their advice is eagerly sought, and the Board is convinced that there is to-day a strong mutual co-operation between Bureau members and Departmental officers generally."

Monday evening's session concluded with an address, illustrated with lantern views, "The Coral Islands of the Great Barrier Reef," by Mr. C. G. Lewis, A.C.U.A., secretary to the Director of Education.

Tuesday, 17th September.

On Tuesday morning Mr. C. E. Verco (Mount Compass) read a paper, "Dairying," and Mr. R. C. Pocock (Lameroo) dealt with the subject of "Pigs and their Management."

Tuesday Afternoon.

The following papers were read:—"The Care of Farm Harness" Mr. R. H. Eime (Blyth); "Some Further Results of Pasture Work at Kybybolite," Mr. L. J. Cook (Manager Kybybolite Experimental Farm); "The Branding of Livestock," Mr. O. H. Laurenti, Registrar of Brands (Stock and Brands Department). At the special session held for Branches in the Fruitgrowing Districts, Mr. A. G. Strickland, M.Sc. (Chief Horticultural Instructor) delivered an address, illustrated with lantern slides, and Mr. R. Cramond, of the Lenswood Branch, read a paper, "What can we do to Aid the Distribution of Fruit in our own State?"

An address, illustrated with lantern views, was given by Mr. W. J. Spafford (Deputy Director of Agriculture) on his tour of the Southern Hemisphere, on Tuesday evening.

Wednesday, 18th September.

Wednesday morning was devoted to Free Parliament, and the following resolutions were carried:—

Moved by Mr. T. Hewland (Adelaide), seconded by Mr. J. Hudd (Adelaide): "That this Congress applauds the quota and equalization plans applying to butter and cheese and that the delegates here assembled urge Parliament to re-enact without delay the Dairy Produce Act of 1934 with the amendments thereto asked for by the South Australian Dairymen's Association."

Moved by Mr. J. Vigar (Mount Hope), seconded by Mr. H. Howard (Petina): "That it be a recommendation from this Congress to all Branches of the Bureau that the May meeting of each year be devoted to a discussion on 'Tree Culture.' "

Moved by by H. B. Scholz (Pinbong) seconded by Mr. T. Roenfeldt (Greenock): "That this Congress urges landholders to plant shade trees on farms and stations and that district councils be asked to conserve and plant trees in the territory under their control."

Moved by Mr. A. Pengilly (Alawoona), seconded by Mr. T. Winters (Taragoro): "That the Farmers Assistance Board be approached to increase to applicants under the Board the petty cash allowance of £12 to £24, the same to be paid in two payments as at present."

Moved by Mr. B. C. Black (Minnipa), seconded by Mr. G. Potts (Minnipa): (*a*) "That the Sales Tax on all agricultural oils used on the farm be removed. (*b*) "That the Sales Tax on lubricating oil used for power in primary production be abolished as has previously been asked for."

Moved by Mr. B. C. Black (Minnipa) seconded by Mr. F. Masters (Roberts and Verran): "That the Government be asked at the termination of the present share-farming agreement to convert the Minnipa Government Farm into a seed wheat and stud farm for the purpose of providing seed wheat to farmers at a reasonable cost."

Moved by Mr. T. Holman (Kyancutta) seconded by Mr. G. Potts (Minnipa): "That this Congress ask the Government to assess water rates on a more equitable system."

Moved by Mr. F. Masters (Roberts and Verran) seconded by Mr. R. Mayfield (Kelly): "That all revenue raised by the Government for motor taxation be used for construction and maintenance of roads."

Moved by Mr. J. Wray (Kybybolite), seconded by Mr. A. Nash (Shoal Bay): "That motions brought before District Conferences should be carried by the majority of delegates present before being passed on to the Advisory Board."

Moved by Mr. F. Masters (Roberts and Verran), seconded by Mr. R. Mayfield (Kelly): "That the subsidy under the bull tax be increased by the Government paying the cost of the transport of the animal, in order to give greater benefit to its contributors."

Moved by Mr. R. Mayfield (Kelly), seconded by Mr. J. Hannan (Kelly): "That this Congress strongly resists any efforts to lower the registration fee of Alsatian dogs."

Moved by Mr. R. Mayfield (Kelly), second by Mr. J. Hannan (Kelly): "That the Government be asked to take immediate steps to make the dehorning of bulls compulsory."

Moved by Mr. D. Ingram (Pygery), seconded by Mr. F. Densley (Tatiara): "That veterinary officers be appointed to inspect stallions on Eyre's Peninsula for Government certificate of soundness the same as is done in other parts of the State."

Moved by Mr. W. J. Hemmings (Kalangadoo), second by Mr. R. Messenger (Kalangadoo): "That Congress urge the Federal Government to remove the duty from imported wire-netting or substantially reduce same."

Moved by Mr. D. Butler (Wolseley), seconded by Mr. W. Snead (Wolseley): "That the Government be urged to introduce legislation this session enabling a bulk-handling system to be installed in South Australia."

Moved by Mr. H. Scheer (Frayville), seconded by Mr. T. Roenfeldt (Greenock): "That bounties (if any) be distributed as last year, on acreage and bushel basis."

Moved by Mr. D. Butler (Wolseley), seconded by Mr. W. Snead (Wolseley): "That the Government be urged to see that the administration of the Noxious Weeds Act be made more effective, particularly in relation to Bathurst burr."

Moved by Mr. J. Colebatch (Port Elliot), seconded by Mr. W. Bennett): "That the Advisory Board be recommended to request the combined Governments of the Commonwealth to unite in an endeavour to publish a 'Noxious Weeds Reference Book' for the use of the Education Departments in all States of the Commonwealth and that every Branch of the Agricultural Bureau be asked to foster the use of the books in schools."

Moved by Mr. R. Miller (Saddleworth), seconded by Mr. W. Coleman (Saddleworth): "That Congress requests the Advisory Board to approach stock agents as a body and ask them to review their charges at country markets."

Moved by Mr. D. Noble (Arthurton), seconded by Mr. J. Prouse (Paskeville): (*a*) "That the Fire Act be amended making it possible for one man to do fire harrowing"· (*b*) "That Congress request an amendment of the law affecting fire raking making it possible for one man to do fire raking of stubble without the consent of a fire controller."

Moved by R. Schulz (Koonunga), seconded by Mr. T. Roenfeldt (Greenock): "That a Congress be held every year."

Moved by Mr. F. Master (Roberts and Verran), seconded by Mr. W. J. Hemmings (Kalangadoo): " That this Congress proposes the abolition of the South Australian butter stabilization scheme."

Moved by Mr. F. Cramond (Lenswood and Forest Range): "That the Education Department be asked to assist in advertising the value of fruit by instructing teachers to give lessons at least once a month on the advantages of fruit in the daily diet."

Resolution Lost.

"That the Dairy Industry Act of 1928 be amended so that payment can be made on the basis of 'Commercial Butter' instead of 'Butterfat.' "

In the evening Dr. A. R. Callaghan, Principal of the Roseworthy Agricultural College, spoke on "Progress in the Improvement of the Baking Quality of South Australian Wheat."

On Thursday morning delegates under the guidance of Dr. A. E. V. Richardson inspected the Waite Agricultural Research Institute.

CODLING MOTH CONTROL EXPERIMENTS, BLACKWOOD, 1934-35.

[R. Fowler, Manager, Blackwood Experimental Orchard.]

During the season 1934-35 one of the worst outbreaks of codling moth ever experienced in this district occurred. In spite of the fact that it was an "off" year as far as apples and pears were concerned the crop was not abnormally light on many trees of the Jonathan and Cleopatra varieties used in the tests. In the 1933-34 season codling moth infestation was comparatively slight, the wastage in the spraying tests ranging from 1.37 per cent. to 2.90 per cent. As all due precautions were taken in the way of cleaning up windfalls, attending to bandages, scraping off rough bark, &c., it seemed safe to assume that the number of overwintering larvae would be small, but evidently this was not so judging by the numbers of spring brood moths caught in the bait traps.

The summer was cool with very few days when the temperature reached or exceeded 100° Fahr., and though some rain fell in the early summer the latter part of the season was dry. The number of spraying schedules this season was reduced to five, such schedules being replicated. The schedules were designed as in the previous season to test the control value of summer oil sprays, bearing in mind the relative costs of arsenate of lead and oil sprays, and the question of arsenical residue on harvested fruit.

Studies were continued on the following aspects:—

(1) Lures and bait traps, both as a means of reducing the moth population in the orchard, and of determining the best time to apply cover sprays.

(2) Bandages, both chemical and ordinary, for trapping codling moth larvae moving up or down the tree.

Bait Trap and Lure Experiments.

These experiments have been in progress for many years, but still afford useful information. Various types of glass jars and pots have been used, both wide and narrow mouth, and with variable results. From the evidence accumulated during the last three seasons it would seem advisable that to ensure accurate data on the emergence of moths, a ½in. wire netting mesh cover should be placed over any wide-mouthed jars used in order to prevent removal of trapped moths by small birds. Molasses and vinegar were used as lures, the former at the rate of 1 in 16, and the latter 1 in 10. For some years the use of vinegar had been discontinued because in previous tests it had been found much inferior as an attractant, and far more destructive to beneficial insects. The results again confirmed our previous experience.

In this test four rows each containing 12 Cleopatra apple trees were used. In rows 1 and 3, traps were hung in every other tree baited with molasses, every other trap being covered with a wire netting cover. Rows 2 and 4 were treated in the same way, excepting that vinegar was used instead of molasses in the traps. The catch of moths is indicated in Table I.

TABLE I.—*Results of Trials with Molasses and Vinegar as Lures, and with Covered and Uncovered Traps.*

Location of Traps.		5/11/34	12/11/34	19/11/34	26/11/34	3/12/34	10/12/34	17/12/34	24/12/34	31/12/34	7/1/35	14/1/35	21/1/35	28/1/35	4/2/35	11/2/35	18/2/35	25/2/35	4/3/35	11/3/35	18/3/35	Total.
Manure Test, rows 1-3 ...	Covered...	26	5	2	68	46	54	53	23	10	1	32	6	14	4	12	53	88	50	33	1	581 }752
Molasses, 1-16	Uncovered	11	1	2	8	—	2	8	5	1	1	5	6	8	3	9	25	41	23	12	—	171
Manure Test, rows 2-4 ...	Covered...	19	2	2	29	8	1	6	4	—	—	5	2	7	—	1	3	28	24	14	—	155 }217
Vinegar, 1-10	Uncovered	13	2	4	—	—	—	1	1	—	—	—	—	—	—	—	3	21	11	6	—	62
	Totals	69	10	10	105	54	57	68	33	11	2	42	14	29	7	22	84	178	108	65	1	969

Catch with molasses lure, 752 ; covered traps, 581 ; uncovered, 171.
Catch with vinegar lure, 217 ; covered traps, 155 ; uncovered, 62.

It will be noted that in rows 1 and 3 in which molasses baits were used, the number of moths caught was 752—581 in the covered traps, and 171 in the uncovered. In rows 2 and 4 with vinegar 217 moths were caught—155 in the covered traps, and 62 in the uncovered. The percentage catch per trap with molasses was 62.66, and with vinegar 18.08. The experiment was repeated on a larger scale on a block of 400 trees. Seventy-two deep, fairly wide-mouthed jars were used without covers and were distributed evenly through the block. The catch of moths showed 40.75 per trap with molasses, and 5.7 per jar with vinegar. The vinegar used was pure apple vinegar, as it was thought probable this would prove more attractive to codling moth than either wine or malt vinegar. No records were made of beneficial insects caught, as previous experiments were fairly definite in this respect.

In order to determine emergence periods of moths 42 traps were used in different parts of the orchard. Regular weekly counts were made as to the number of moths trapped, and in most cases, sex determinations. Results are indicated in Table II:—

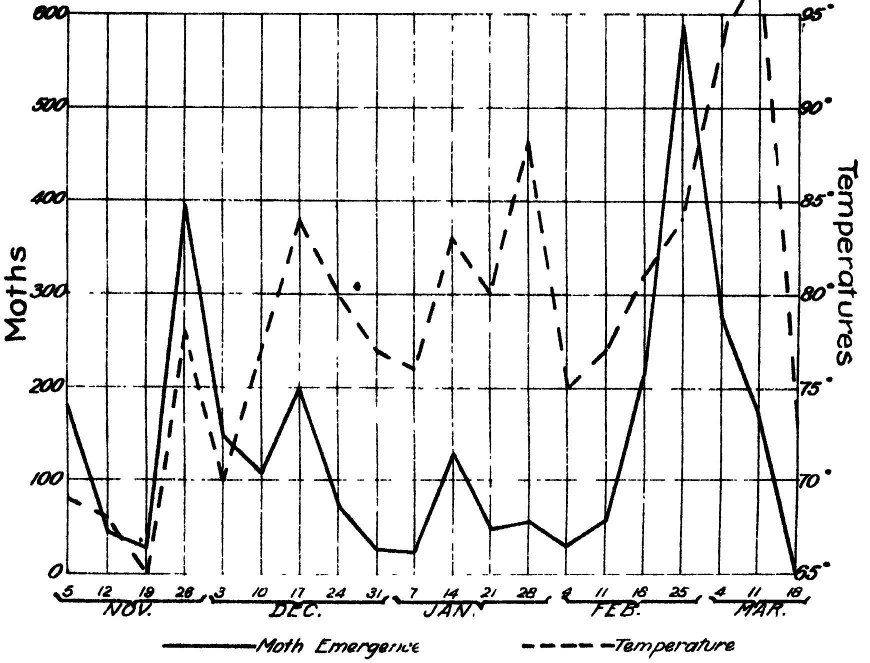
Table II.—*Weekly Counts of Codling Moths in Bait Traps, Blackwood,* 1934-35.

Week ending.	Moths Trapped.	Codling Moth Sex Determination.			Remarks.
		Males.	Females.	Total Examined.	
5/11/34	180	79	98	177	
12/11/34	47	16	12	28	
19/11/34	27	20	13	33	
26/11/34	395	170	203	373	
3/12/34	147	66	79	145	Number of traps used, 42.
10/12/34	109	67	42	109	Average catch per trap, 67·19.
17/12/34	200	90	102	192	First moth caught 23rd October, 1934.
24/12/34	75	No exam	ination ma	de	
31/12/34	25	No exam	ination ma	de	Sex determination.
7/1/35	22	No exam	ination ma	de	Moths examined, 2,040; males 838, females 1,202.
14/1/35	130	45	89	134	
21/1/35	48	28	18	46	Percentage males to females.
28/1/35	57	25	21	46	Spring brood, 48·06 to 51·94 per cent.
4/2/35	29	6	78	24	Second brood, 33·57 to 66·43 per cent.
11/2/35	57	15	42	57	
18/2/35	212	62	147	209	
25/2/35	588	No exam	ination ma	de	
4/3/35	297	84	198	282	
11/3/35	172	64	116	180	
18/3/35	5	1	4	5	
	2,822	838	1,202	2,040	

An examination of the figures shows that 2,822 moths were trapped, or an average of approximately 67 per trap. Sex determinations were made of 2,040 moths, and of these 838 were males and 1,202 females. As in previous seasons, it was noted that the percentage of females to males appears to increase in the second brood—66.46 to 33.54. These figures are almost in the same ratio as those for the season 1933-34. The first moths were also trapped on the same day each year (23rd October). A comparison of the codling moth infestation in the various plots in trapped and untrapped portions of the orchard reveals that the wastage due to codling moth injury was no greater where traps were not used than where large numbers of moths were caught. This again confirms previous experience, and it would seem therefore that the chief value attachable to the bait traps is the information afforded as to the emergence periods of the moths for the proper timing of cover sprays.

On Graph No. 1 the weekly counts of the numbers of moths trapped are plotted together with mean maximum shade temperatures. Two distinct maximum emergence periods are shown—the first or spring brood reaching a peak on 26th November, and the second brood on 25th February. In comparison with the previous season the spring brood peak emergence was much earlier than in 1933, when it occurred on 11th December. The second brood emergence synchronised almost with that of last year, on 26th February, and late apples were badly infested by this brood even where an extra sixth spray was applied; a very high percentage of stings was recorded in the Granny Smith variety.

GRAPH SHOWING {Weekly Counts of Moths caught: and Maximum Shade Temperatures.



EXPERIMENTS WITH BANDAGES.

Bandages of the ordinary bag type were applied to all the trees in the experimental plots during the second week in December. These bandages were examined at regular weekly intervals until the 1st February, and records made of the number of larvae caught. Table III. indicates the result.

Table III.—*Weekly Counts of Codling Moth Larvae Caught in Bandages, Blackwood,* 1934-35.

Date Examined.	No of Larvae.	Date Examined.	No. of Larvae.	
13/12/34	—	8/2/35	154	
24/12/34	30	15/2/35	194	Total catch from 189 bandages, 2,011
4/1/35	74	22/2/35	177	
11/1/35	77	1/3/35	162	Average per bandage, 10·63
18/1/35	116	8/3/35	139	
25/1/35	112	15/3/35	162	
1/2/35	116	18/4/35	498	

Two thousand and eleven grubs were caught in 189 bandages, an average of 10.63 per bandage. Odd grubs only were caught during December, but from then onwards the numbers rose, and were fairly consistent till the end of the season.

Average Type of Apple Tree in Spraying Tests, showing bait trap in upper branches.

Only 498 grubs were found in the bandages when finally examined in early winter this year as compared with 1,171 the season before in the same number of bandages on the same trees. These figures in conjunction with those indicating the large numbers of moths caught in the bait traps at the end of the season would seem to indicate that more than the usual number of larvae of the second brood transformed into moths, and therefore fewer grubs were left to overwinter. Chemical bandages were also used on a few mixed varieties of apples in a portion of the orchard not used for spraying tests but sprayed in routine manner with arsenate of lead. The bandages were put out during the first week in January, 1935, when the catch in the normal bandages indicated that the codling grubs were emerging, so that the toxic properties of the bandage might be conserved as long as possible. An ordinary bag bandage was placed above and below the chemical bandage as in the previous year's experiment. The object was:—

(1) To gain some knowledge of the movements of the codling grubs after leaving the fruit.

(2) To ascertain whether the beta-naphthol in the bandages would repel the grubs in any way.

The bag bandages were examined weekly, and the chemical bandage remained untouched till the end of May. The final figures showed that 337 grubs were caught in the top bandage, 462 in the chemical, and 303 in the bottom bandage. This result confirms last year's experience, and apparently indicates that the majority of grubs do not fall to the ground when they leave the fruit. Many evidently climb about the limbs and down the trunk in search of a hiding place. Since more grubs were caught in the chemical bandages than in either the top or bottom bandage it is evident that the grubs are not repelled by the beta-naphthol. Of the 462 grubs caught in the chemical bandages 75 were found to be alive, though most of them were affected in some way by the chemical, being almost reddish-brown in colour with a dark line along the body. Since apparently this type of bandage loses its toxic property at the end of the season, they should not be left to rot on the tree, but carefully taken off and burnt before the end of May. No injury was noticeable on trees bandaged with this type of bandage for the past three years, but in all cases the trees used had fairly old and rough bark.

SPRAYING EXPERIMENTS.—DISCUSSION OF RESULTS.

All spray schedules have been applied with the object of determining their effectiveness in control of codling moth, and the extent to which they result in arsenical residue on harvested fruit; at the same time attention has been given to costs of the various schedules. All trees in the test plots from which records were taken comprised the Cleopatra variety, with the exception of Plot B1, which consisted of Jonathans. The trees were all fairly well grown, and good average trees for their age. Main plots contained 12 trees each, and the replication from six to eight trees.

Details of spray schedules were as follows:—

Details of Spray Schedules, Blackwood, 1934-35.

Spray No.	Spray Material.	Date of Application.	
	Schedule A.—12 Trees, Cleopatra variety—		
1	*Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	29/10/34	Calyx spray
2	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	14/11/34	1st cover spray
3	Lead arsenate, 3lbs. to 100gals. water with ½lb. spreader	13/12/34	2nd cover spray
4	Lead arsenate, 3lbs. to 100gals. water with ½lb. spreader	15/1/35	3rd cover spray
5	Lead arsenate, 3lbs. to 100gals. water with ½lb. spreader	14/2/35	4th cover spray
	Schedule B.—12 Trees, Cleopatra variety—		
1	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	29/10/34	Calyx spray
2	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	14/11/34	1st cover spray
3	Lead arsenate, 3lbs. to 100gals. water with ½lb. spreader	13/12/34	2nd cover spray
4	White Oil, 1-60	15/1/35	3rd cover spray

Details of Spray Schedules, Blackwood, 1934-35—continued.

Spray No.	Spray Material.	Date of Application.	
5	White oil, 1-60	14/2/35	4th cover spray
	Schedule B1.—12 Jonathans—		
1	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	29/10/34	Calyx spray
2	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	14/11/34	1st cover spray
3	White oil, 1-60	13/12/34	2nd cover spray
4	White oil, 1-60	15/1/35	3rd cover spray
5	White oil, 1-60	14/2/35	4th cover spray
	Schedule C.—12 Cleopatra—		
1	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	29/10/34	Calyx spray
2	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	14/11/34	1st cover spray
3	White oil, 1-60	13/12/34	2nd cover spray
4	Lead arsenate, 3lbs. to 100gals. water with ½lb. spreader	15/1/35	3rd cover spray
5	White oil, 1-60	14/2/35	4th cover spray
	Schedule D.—12 Cleopatra—		
1	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	29/10/34	Calyx spray
2	Lead arsenate, 4lbs. to 100gals. water with ½lb. spreader	14/11/34	1st cover spray
3	Lead arsenate, 2lbs. to 100gals. white oil, ¾gal. to 100gals.	13/12/34	2nd cover spray
4	Lead arsenate, 2lbs. to 100gals. white oil, ¾gal. to 100gals.	15/1/35	
5	White oil, ¾gal. to 100gals. Nicotine sulphate 1-1,600 ...	14/2/35	—

* Lead arsenate in powder form used in all Schedules.

Computations of results were made as in past seasons by examination and weighing of all fruit, including windfalls harvested from all the trees in the test. No distinction was made between entrances and stings provided the blemish rendered the fruit unfit for export. A study of the figures from trees carrying comparable crops reveals a considerable tree to tree variation in the wastage due to codling injury under the same spray treatment, *e.g.*, in the case of two lead sprays followed by three oil sprays there was a general average infection of 7.08 per cent., whereas individual tree wastages varied from 3.1 per cent. to 10.17 per cent. Bait traps and bandages were used in the main plots and bandages only in the replication. The calyx spray was applied when the petals had fallen from most of the blossoms, and the first cover spray from 12 to 14 days later. Other sprays were timed to meet the maximum emergence of moths as nearly as possible. The spray was applied with a motor spray pump more in the form of a coarse coverage than a misty spray, and at a pressure of from 175lbs. to 200lbs. using pistol grips fitted with rod and nozzle attachments. Every effort was made to see that the work was thoroughly done at each application. Table IV. sets out the spraying results:—

An examination of the table reveals that quite a fair average control was maintained by all the schedules, considering that it was an off season and the crop of apples was very variable in each test, ranging from a few pounds to an average crop. Schedule B1 applied to Jonathans only, gave the best results as regards wastage (7.08 per cent.), but is not comparable with other schedules applied to Cleopatra only, and is therefore not included in Table IV. In the replicated plot no bait traps were used, and the results again confirm previous experience that reducing the codling moth by trapping does not seem to appreciably reduce the wastage caused by codling injury.

TABLE IV.—*Results of Spraying Tests, Blackwood*, 1934-35.

All Cleopatra Apple Trees.

Sch.	No. of Trees.	Spray Schedule.	Main Plots.					Replication.				
			Clean Fruit, in Lbs.	Codling Fruit, in Lbs	Percentage of Codling by Weight	No. of Moths Caught	No. of Larvae Caught	No. of Trees.	Clean Fruit, in Lbs.	Codling Fruit, in Lbs.	Percentage of Codling by Weight	No. of Larvae Caught
A	12	Lead arsenate five times	837¼	126¾	15·14	385	129	6	884¾	78¾	8·9	317
B	12	Lead arsenate three times, two cover sprays white oil	1,071	137	12·81	142	165	8	805¼	40¼	5.00	131
C	12	Lead arsenate twice, then oil-lead-oil	1,432¾	143¾	10·03	367	173	7	1,234¾	93	7·53	330
D	12	Lead arsenate twice, combined oil and lead twice, combined oil and nicotine sulphate	723¾	69½	9·61	75	89	8	1,898¾	121¾	6·41	452

Half-pound spreader to 100galls. used in all lead sprays.
Bag bandages used on all trees. No bait traps used in replication.

In the main and replicated plots there is really very little significant difference unless it is between A and D, and even between these two plots the difference is no greater than between two trees in the same plot. Control with arsenate of lead alone was slightly less satisfactory this season. This result may possibly be due to the fact that the concentration was reduced from 4lbs. to 3lbs. per 100galls. in the last three cover sprays. In previous experiments the heavier concentration gave better results than the weaker one.

In Plot B1 the three oil sprays had no detrimental effect on the colour or appearance of the Jonathan apples, though they were slightly dusty. On the Cleopatras, however, the use of white oil in Schedules B and C caused considerable injury and loss through oil spotting. In Schedule D the oil was used in combination with the arsenate of lead at the rate of only ⅜gall. to 100galls. of spray, and practically no oil spotting resulted. Under similar conditions to those prevailing at Blackwood white oil sprays alone at a strength of 1gall. in 60galls. in the last two or three cover sprays should be used with extreme caution on the Cleopatra variety.

ARSENICAL RESIDUES.

One of the main reasons for including white oil sprays in the schedule is the reduction of the arsenical residue to an amount permitted by health authorities. Representative samples from each spray schedule were taken from boxes of fruit in the packing shed and submitted to the Director of Chemistry for analysis, to whom we are indebted for the following report:—

Plot.	Spray Schedule.	Hundredths of a Grain of As_4O per lb.
A	Lead arsenate with spreader five times	·030
B	Lead arsenate three times followed by two oil sprays	·025
B1	Lead arsenate, twice, followed by three oil sprays	·010
C	Lead arsenate, twice, followed by oil, lead, oil	·025
D	Lead arsenate, twice, followed by oil and lead combined twice, and white oil and nicotine sulphate once	·042

In all these schedules the arsenical residue is above the tolerance with the exception of B1, which is just on the limit. Apples from these tests showed visible signs of arsenical residue, and all were treated before shipment overseas by dipping in a washing solution. Washing experiments were conducted with various dipping solutions, and these experiments will be the subject of further report.

SPRAYING COSTS.

Table V. shows the approximate cost of each spray schedule on the basis of 100galls. of spray:—

TABLE V.

Schedule.	Arsenic Sprays.			Oil Sprays			Nicotine Sprays.		Spreader.	Total Cost.	Extra Cost over A.
	No. of Sprays	Cost.	Total.	No. of Sprays	Cost.	Total.	No. of Sprays	Cost.			
A	*2 †3	3 2 2 4½	6 4 7 1 13 5	—	—	—	—	—	3 9	0 17 2	—
B	2 1	3 2 2 4½	6 4 2 4 8 8	2	7 6	0 15 0	—	—	2 3	1 5 11	8 9
B1	2	3 2	6 4	3	7 6	1 2 6	—	—	1 6	1 10 4	13 2
C	2 1	3 2 2 4	6 4 2 4 8 8	2	7 6	0 15 0	—	—	2 3	1 5 11	8 9
D	2 ‡2	3 2 1 7	6 4 3 2 9 6	3	3 4½	0 10 1	1	3 5	1 6	1 4 6	7 4

* 4lbs. per 100gals. † 3lbs. per 100gals. ‡ 2lbs. per 100gals.

It will be seen that the addition of white oil emulsion sprays added considerably to the costs of materials used, and without very materially increasing the codling control, as shown by the inconsistent results obtained. The total cost column in the above table represents the approximate cost per ½ acre or 50 average sized trees. No attempt has been made to work out a profit and loss table. This is not possible with any degree of accuracy when the crop is light and variable and the significant differences are small.

SUMMARY.

(1) Results of spray schedules were inconsistent, but on the whole gave fairly satisfactory control use.

(2) White oil emulsion sprays gave materially the same control as did arsenate of lead sprays, and when used for the last three covers resulted in less arsenical residue.

(3) White oil emulsion sprays should be used with caution on Cleopatra apples, but appear safe when used on other varieties.

(4) Molasses as a lure proved more effective than apple vinegar.

(5) Covered traps should be used to prevent birds interfering with records of moths trapped.

(6) Reducing the moth population in the orchard by trapping does not seem to reduce the wastage due to codlin injury.

(7) Chemical bandages are effective traps for codling larvae.

My thanks are due to Mr. C. Pollitt for assistance rendered in the preparation of this report in checking data and plotting of graph.

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FERTILISERS ACT, 1918—ANALYSES OF FERTILISERS.

In half-yearly periods to June and December, 1934, and June, 1935.

Results of analyses obtained by the Government Agricultural Analyst from samples procured by Inspectors of Fertilisers during the six months ended 30/6/34.

NOTE.—*Deficiencies greater than permitted under Section 12 of the Act are shown in bold type.*

Sample No.	Name of Firm and Fertiliser.	Phosphate.								Nitrogen.		Nitrogen as Nitrates.	
		Water Soluble.		Citrate Soluble.		Acid Soluble.		Total.					
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.
		%	%	%	%	%	%	%	%	%	%	%	%
	Adelaide Chemical and Fertilizer Co., Ltd.—												
2432	Blood Manure	—	—	—	—	—	—	—	—	13·0	13·8	—	—
2286	Blood Manure	—	—	—	—	—	—	—	—	13·0	14·3	—	—
2425	Bone and Super	21·0	24·0	10·0	11·2	12·0	16·2	43·0	51·4	1·6	2·0	—	—
2287	Bone and Super.	21·0	20·9	10·0	14·1	12·0	13·5	43·0	48·5	1·6	2·0	—	—
2282	Bone Dust	—	—	—	—	40·0	41·9	40·0	41·9	3·5	3·7	—	—
2431	Bone Dust	—	—	—	—	40·0	46·4	40·0	46·4	3·25	4·2	—	—
2422	48% Mineral Super.	48·0	47·6	—	—	—	—	48·0	47·6	—	—	—	—
2285	48% Mineral Super.	48·0	48·2	—	—	—	—	48·0	48·2	—	—	—	—
2423	Top Special Super.	45·0	46·6	—	—	—	—	45·0	46·6	—	—	—	—
2284	Top Special Super	45·0	45·6	—	—	—	—	45·0	45·6	—	—	—	—
2430	Top Special Super.	45·0	45·4	—	—	—	—	45·0	45·4	—	—	—	—
	Barrett, B. A.—												
2434	Carbonate Mixture	—	—	—	—	—	—	—	—	1·25	1·28	—	—
	Chester Chemical Products—												
2283	Filtered Soil	—	—	—	—	—	—	—	—	2·13	4·55	—	—
	Cresco Fertilizers Limited—												
2421	45 Super.	45·0	46·5	—	—	—	—	45·0	46·5	—	—	—	—
2429	45 Super.	45·0	44·3	—	—	—	—	45·0	44·3	—	—	—	—
2296	45 Super.	45·0	44·5	—	—	—	—	45·0	44·5	—	—	—	—
2436	45 Super.	45·0	47·2	—	—	—	—	45·0	47·2	—	—	—	—
2440	45 Super.	45·0	47·2	—	—	—	—	45·0	47·2	—	—	—	—
2427	48 Super.	48·0	47·6	—	—	—	—	48·0	47·6	—	—	—	—
2428	Super. and Ammonia, 2 and 1	30·0	29·1	1·0	1·9	1·0	1·0	32·0	32·0	6·87	7·6	—	—
	Government Produce Department—												
2289	Blood Manure	—	—	—	—	—	—	—	—	13·0	13·2	—	—
2288	Bone Manure	—	—	—	—	25·0	30·2	25·0	30·2	7·0	6·53	—	—
	Hoffmann, H. W.—												
2426	Para Bone Manure	—	—	—	—	40·0	51·4	40·0	51·4	3·5	4·2	—	—

ANALYSES OF FERTILISERS—*continued.*

Sample No.	Name of Firm and Fertiliser.	Potash in Water Soluble Form.		Calcium Oxide, CaO.		Calcium Oxide Expressed as Calcium Sulphate, CaSO4.		Bone Manure, Fine Material.		Agricultural Lime, Fine Material.		Gypsum, Fine Material.		Phosphate Fertiliser, Fine Material.		Moisture.
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	
		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	Adelaide Chemical and Fertilizer Co., Ltd.—															
2432	Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10·4
2286	Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·18
2425	Bone and Super	—	—	—	—	—	—	60·0	60·0	—	—	—	—	—	—	4·00
2287	Bone and Super.	—	—	—	—	—	—	60·0	63·0	—	—	—	—	—	—	8·17
2282	Bone Dust	—	—	—	—	—	—	50·0	57·0	—	—	—	—	—	—	6·6
2431	Bone Dust	—	—	—	—	—	—	50·0	40·0	—	—	—	—	—	—	5·6
2422	48% Mineral Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·7
2285	48% Mineral Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·67
2423	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·9
2284	Top Special Super	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·9
2430	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·9
	Barrett, B. A.—															
2434	Carbonate Mixture	—	—	40·0	44·3	—	—	—	—	80·0	94·5	—	—	—	—	1·9
	Chester Chemical Products—															
2283	Filtered Soil	0·6	0·22	—	—	—	—	—	—	—	—	—	—	—	—	3·5
	Cresco Fertilizers Limited—															
2421	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·8
2429	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5·1
2296	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·37
2436	45 Super	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·9
2440	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·0
2427	48 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·5
2428	Super. and Ammonia, 2 and 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3·2
	Government Produce Department—															
2289	Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·43
2288	Bone Manure	—	—	—	—	—	—	75·0	75·0	—	—	—	—	—	—	5·24
	Hoffmann, H. W.—															
2426	Para Bone Manure	—	—	—	—	—	—	40·0	66·5	—	—	—	—	—	—	7·0

ANALYSES OF FERTILISERS—*continued*.

Sample No.	Name of Firm and Fertiliser.	Phosphate.								Nitrogen.		Nitrogen as Nitrates.	
		Water Soluble.		Citrate Soluble.		Acid Soluble.		Total.					
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.
	Metropolitan Abattoirs Board—	%	%	%	%	%	%	%	%	%	%	%	%
2279	M.A.B. Blood Manure	—	—	—	—	—	—	—	—	13·0	13·7	—	—
2280	M.A.B. No. 1 Bone Manure	—	—	—	—	25·0	26·2	25·0	26·2	7·5	7·1	—	—
2281	M.A.B. No. 2 Bone Manure	—	—	—	—	25·0	30·0	25·0	30·0	4·5	6·1	—	—
	Shell Fertilizers Limited—												
2278	Ground Oyster Shell	—	—	—	—	—	—	—	—	—	—	—	—
	S.A. Gas Company—												
2424	Sulphate of Ammonia	—	—	—	—	—	—	—	—	20·0	20·9	—	—
2276	Sulphate of Ammonia (neutral)	—	—	—	—	—	—	—	—	20·0	21·3	—	—
2277	Sulphate of Ammonia	—	—	—	—	—	—	—	—	20·0	20·6	—	—
	Wallaroo-Mt. Lyell Fertilisers, Ltd.—												
2295	Bone Dust	—	—	—	—	40·0	45·4	40·0	45·4	3·25	3·5	—	—
2291	W.M.L. Granular High Grade Super.	45·0	45·8	—	—	—	—	45·0	45·8	—	—	—	—
2292	W.M.L. High Grade Super.	45·0	44·0	—	—	—	—	45·0	44·0	—	—	—	—
2433	W.M.L. High Grade Super.	45·0	50·0	—	—	—	—	45·0	50·0	—	—	—	—
2437	W.M.L. High Grade Super.	45·0	46·0	—	—	—	—	45·0	46·0	—	—	—	—
2439	W.M.L. High Grade Super.	45·0	48·0	—	—	—	—	45·0	48·0	—	—	—	—
2438	W.M.L. 48% Super.	48·0	48·2	—	—	—	—	48·0	48·2	—	—	—	—
2293	Sulphate of Ammonia	—	—	—	—	—	—	—	—	20·0	21·1	—	—
2294	2 : 1 Super and Ammonia No. 3	30·0	31·2	1·0	3·0	1·0	0·7	32·0	34·9	6·87	7·25	—	—
	Webb, A. J.—												
2435	Carbonate of Lime	—	—	—	—	—	—	—	—	—	—	—	—

ANALYSES OF FERTILISERS—*continued.*

Sample No.	Name of Firm and Fertiliser.	Potash in Water Soluble Form.		Calcium Oxide, CaO.		Calcium Oxide Expressed as Calcium Sulphate, CaSO4.		Bone Manure, Fine Material.		Agricultural Lime, Fine Material.		Gypsum, Fine Material.		Phosphate Fertiliser, Fine Material.		Moisture.
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	
	Metropolitan Abattoirs Board—	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
2279	M.A.B. Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·0
2280	M.A.B. No. 1 Bone Manure	—	—	—	—	—	—	50·0	52·0	—	—	—	—	—	—	9·9
2281	M.A.B. No. 2 Bone Manure	—	—	—	—	—	—	55·0	71·0	—	—	—	—	—	—	5·8
	Shell Fertilizers Limited—															
2278	Ground Oyster Shell	—	—	30·0	36·2	—	—	—	—	80·0	77·5	—	—	—	—	1·5
	S.A. Gas Company—															
2424	Sulphate of Ammonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·14
2276	Sulphate of Ammonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·15
2277	Sulphate of Ammonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·5
	Wallaroo-Mt. Lyell Fertilisers, Ltd.—															
2295	Bone Dust	—	—	—	—	—	—	50·0	51·0	—	—	—	—	—	—	5·2
2291	W.M.L. Granular High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·09
2292	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·57
2433	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·7
2437	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·3
2439	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5·2
2438	W.M.L. 48% Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·3
2293	Sulphate of Ammonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·08
2294	2 : 1 Super and Ammonia No. 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4·8
	Webb, A. J.—															
2435	Carbonate of Lime	—	—	47·3	49·6	—	—	—	—	92·0	95·8	—	—	—	—	1·7

Results of analyses obtained by the Government Agricultural Analyst from samples procured by Inspectors of Fertilisers, during the six months ended 31/12/34.

Sample No.	Name of Firm and Fertiliser.	Phosphate:								Nitrogen.		Nitrogen as Nitrates.	
		Water Soluble.		Citrate Soluble.		Acid Soluble.		Total.					
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.
		%	%	%	%	%	%	%	%	%	%	%	%
	Adelaide Chemical and Fertilizer Co., Ltd.—												
2442	Bone and Super.	21·0	22·5	10·0	10·5	12·0	18·4	43·0	51·4	1·6	2·3	—	—
	Heddle, J. A.—												
2297	Bone Manure	—	—	—	—	28·0	31·9	28·0	31·9	4·25	4·1	—	—
	Wallaroo-Mt. Lyell Fertilisers Ltd.—												
2441	W.M.L. High Grade Super.	45·0	46·1	—	—	—	—	45·0	46·1	—	—	—	—

Results of analyses obtained by the Government Agricultural Analyst from samples procured by Inspectors of Fertilisers during the six months ended 31/12/34.—*continued.*

Sample No.	Name of Firm and Fertiliser.	Potash in Water Soluble Form.		Calcium Oxide, CaO.		Calcium Oxide Expressed as Calcium Sulphate, CaSO4.		Bone Manure, Fine Material.		Agricultural Lime, Fine Material.		Gypsum Fine Material.		Phosphate Fertiliser, Fine Material.		Moisture.
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	
		%	%	%	%	%	%	%	%	%	%	%	%	%	%	
	Adelaide Chemical and Fertilizer Co., Ltd.—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2442	Bone and Super.	—	—	—	—	—	—	60·0	59·0	—	—	—	—	—	—	6·6
	Heddle, J. A.—															
2297	Bone Manure	—	—	-	-	—	—	65·0	67·9	—	—	—	—	—	—	6·2
	Wallaroo-Mt. Lyell Fertilisers Ltd.—															
2441	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·2

Results of analyses obtained by the Government Agricultural Analyst from samples procured by Inspectors of Fertilisers during the six months ended 30/6/35.

NOTE.—*Deficiencies greater than permitted under Section* 12 *of the Act, are shown in bold type.*

Sample No.	Name of Firm and Fertiliser.	Phosphate.								Nitrogen.		Nitrogen as Nitrates.	
		Water Soluble.		Citrate Soluble.		Acid Soluble.		Total.					
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.
	Adelaide Chemical and Fertilizer Co. Ltd.—	%	%	%	%	%	%	%	%	%	%	%	%
2354	Abattoirs Blood Manure	—	—	—	—	—	—	—	—	13·0	13·0	—	—
2352	Bone and Super.	21·0	23·0	10·0	8·4	10·0	15·9	41·0	47·3	1·6	2·0	—	—
2353	Bone Dust	—	—	—	—	40·0	47·3	40·0	47·3	3·5	4·2	—	—
2400	No. 1 Complete Manure	20·0	21·8	8·0	9·3	4·0	3·0	32·0	34·1	1·5	1·58	—	—
2901	P.N.P. Mixture	28·0	28·1	1·0	2·0	2·0	1·0	31·0	31·1	1·5	1·72	—	—
2355	Sulphate of Ammonia (neutral)	—	—	—	—	—	—	—	—	20·6	21·2	—	—
2398	2 : 1 Super. and Ammonia No. 3	30·0	30·0	1·0	1·5	1·0	0·7	32·0	32·2	6·87	7·8	—	—
2399	3 : 1 Super. and Ammonia No. 2	34·0	34·3	1·0	1·7	1·0	1·1	36·0	37·1	5·15	5·3	—	—
2351	Top Special Super.	45·0	45·8	—	—	—	—	45·0	45·8	—	—	—	—
2397	Top Special Super.	45·0	46·5	—	—	—	—	45·0	46·5	—	—	—	—
	Cresco Fertilisers Ltd.—												
2363	Blood Manure	—	—	—	—	—	—	—	—	12·0	12·5	—	—
2362	Bone and Super.	21·0	21·4	10·0	6·0	12·0	15·6	43·0	43·0	1·6	1·8	—	—
1721	Complete Manure 2-2-1	18·0	21·1	1·0	1·2	1·0	0·5	20·0	22·8	8·24	8·37	—	—
2392	45 Super.	45·0	46·7	—	—	—	—	45·0	46·7	—	—	—	—
2361	45 Super. (Granulated)	45·0	47·8	—	—	—	—	45·0	47·8	—	—	—	—
401	48 Super.	48·0	48·2	—	—	—	—	48·0	48·2	—	—	—	—
1720	Super. and Ammonia 1 and 1	22·0	24·7	1·0	1·3	1·0	0·6	24·0	26·6	10·3	10·7	—	—
2391	Super. and Ammonia 2 and 1	30·0	30·8	1·0	2·5	1·0	0·9	32·0	34·2	6·87	7·13	—	—
	E. and W. Hackett Ltd.—												
2366	" Floranid "	—	—	—	—	—	—	—	—	46·0	46·5	—	—
2365	" Floraphos	65·0	71·6	—	—	—	—	65·0	71·6	15·6	15·4	—	—
	Heddle, J. A.—												
2851	Bone Manure	—	—	—	—	28·0	32·7	28·0	32·7	42·5	3·9	—	—
	Harris Scarfe Ltd.—												
2368	" Wondergrowth "	133·0	137·0	—	—	—	—	133·0	137·0	12·0	12·1	—	—
	Jacobs, W.—												
1713	Bone Manure	—	—	—	—	—	—	29·0	29·7	4·0	5·56	—	—
	James, A.—												
2389	Carbo-Lime	—	—	—	—	—	—	—	—	—	—	—	
	Wallaroo-Mt. Lyell Fertilisers Ltd.—												
2358	Abattoirs Bone Manure	—	—	—	—	25·0	25·0	25·0	25·0	6·0	7·48	—	—
2359	Blood Manure	—	—	—	—	—	—	—	—	13·0	14·4	—	—
2356	Bone Dust	—	—	—	—	40·0	44·1	40·0	44·1	3·5	3·9	—	—
2393	Guano Super.	27·0	29·7	3·0	4·7	3·0	3·9	33·0	38·3	—	—	—	—
2357	W.M.L. High Grade Super.	45·0	47·6	—	—	—	—	45·0	47·6	—	—	—	—
2394	W.M L. High Grade Super.	45·0	45·1	—	—	—	—	45·0	45·1	—	—	—	—
2902	Island Phosphate	—	—	—	—	82·0	89·5	82·0	89·5	—	—	—	—
2395	L. I. G. E.	28·5	30·9	4·5	7·0	5·0	5·8	38·0	43·7	0·25	0·84	—	—
2396	3 : 1 Super. and Ammonia No. 2	34·0	35·8	1·0	2·1	1·0	0·7	36·0	38·6	5·15	* 5·24	—	—
	Wingfield Casing Coy. Pty Ltd.—												
2390	Blood Manure	—	—	—	—	—	—	—	—	11·0	10·74	—	—

* Other samples were taken during this period, but owing to the unsatisfactory nature of the containers used for sampling, the results are not shown.

Results of analyses obtained by the Government Agricultural Analyst from samples procured by Inspectors of Fertilisers, during the six months ended 30/6/35.—*continued.*

Sample No.	Name of Firm and Fertiliser.	Potash in Water Soluble Form.		Calcium Oxide, CaO.		Calcium Oxide Expressed as Calcium Sulphate. CaSO4.		Bone Manure, Fine Material.		Agricultural Lime, Fine Material.		Gypsum, Fine Material.		* Phosphate Fertiliser, Fine Material.		Moisture.
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis	
	Adelaide Chemical and Fertilizer Co. Ltd.—	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
2354	Abattoirs Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·6
2352	Bone and Super.	—	—	—	—	—	—	60·0	67·8	—	—	—	—	—	—	6·0
2353	Bone Dust	—	—	—	—	—	—	50·0	52·5	—	—	—	—	—	—	4·8
2400	No. 1 Complete Manure	4·5	4·2	—	—	—	—	—	—	—	—	—	—	—	—	6·96
2901	P.N.P. Mixture	7·5	8·2	—	—	—	—	—	—	—	—	—	—	—	—	8·3
2355	Sulphate of Ammonia (neutral)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·1
2398	2 : 1 Super. and Ammonia No. 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·43
2399	3 : 1 Super. and Ammonia No. 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·21
2351	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·8
2397	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·57
	Cresco Fertilisers Ltd.—															
2363	Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·47
2362	Bone and Super.	—	—	—	—	—	—	60·0	86·0	—	—	—	—	—	—	4·46
1721	Complete Manure 2-2-1	9·7	9·1	—	—	—	—	—	—	—	—	—	—	—	—	3·65
2392	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·58
2361	45 Super. (Granulated)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5·68
401	48 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·35
1720	Super. and Ammonia 1 and 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2·08
2391	Super. and Ammonia 2 and 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·46
	E. and W. Hackett Ltd.—															
2366	"Floranid"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·2
2365	"Floraphos"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·49
	Heddle, J. A.—															
2851	Bone Manure	—	—	—	—	—	—	65·0	70·1	—	—	—	—	—	—	5·9
	Harris Scarfe Ltd.—															
2368	"Wondergrowth"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Jacobs, W.—															
1719	Bone Manure	—	—	—	—	—	—	75·0	75·0	—	—	—	—	—	—	9·77
	James, A.—															
2389	Carbo-Lime	—	—	47·0	50·3	—	—	—	—	90·0	98·9	—	—	—	—	0·3
	Wallaroo-Mt. Lyell Fertilisers Ltd.—															
2358	Abattoirs Bone Manure	—	—	—	—	—	—	60·0	67·0	—	—	—	—	—	—	5·15
2359	Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·1
2356	Bone Dust	—	—	—	—	—	—	50·0	55·0	—	—	—	—	—	—	4·9
2393	Guano Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·22
2357	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·8
2394	W.M.L. High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·84
2902	Island Phosphate	—	—	—	—	—	—	—	—	—	—	—	—	100·0	99·7	2·8
2395	L. I. G. E.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·06
2396	3 : 1 Super. and Ammonia No. 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·88
	Wingfield Casing Coy. Pty. Ltd.—															
2390	Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10·98

* Other samples were taken during this period, but owing to the unsatisfactory nature of the containers used for sampling the results are not shown.

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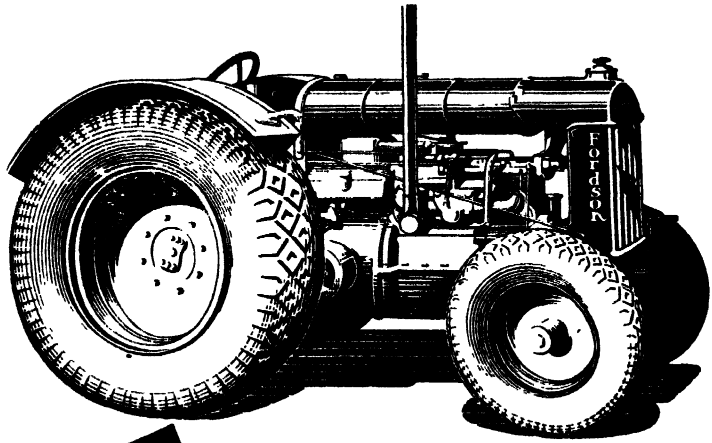

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FORDSON PRICE HAS BEEN REDUCED!

BORDEAUX MIXTURE: ITS MANUFACTURE AND USE.

[A. G. STRICKLAND, M.Sc., Chief Horticultural Instructor.]

Mr. A. G. Strickland, M.Sc., has supplied the following information to the Secretary of the Coonawarra Branch of the Agricultural Bureau, who asked for particulars of the manufacture and use of Bordeaux Mixture:—

No. 1.—(1) Slake 8lbs. of freshly burnt lime, strain off all sediment and make up to 40galls. If a *hydrated lime* is used, instead of quick-lime, no slaking is required: it is only necessary to mix sufficient water with 10*lbs.* (instead of 8lbs.) of the hydrated lime to make 40galls. of lime water. When using a hydrated lime, it should be noted that more of this material is necessary than of freshly burnt quicklime. Fresh quicklime of certain quality is often difficult to obtain, and the use of a prepared hydrated lime in making Bordeaux Mixture is far more satisfactory and strongly recommended.

(2) Dissolve 12lbs. of bluestone ("neige" or "snow" crystals dissolve quickly, and are recommended in preference to the coarser crystals of bluestone), in water, and dilute the solution to a total bulk of 40galls.

(3) Run the 40galls. of lime stock and the 40galls. of bluestone stock simultaneously through strainer into the spraying vat. The limewater and bluestone solution should not be blended until each has been diluted to the necessary extent, *i.e.*, in this case to 40galls. each. Different authorities suggest methods other than the above for mixing Bordeaux Mixture. However, one other method only need be mentioned, *i.e.*, the procedure recommended by Cunningham in New Zealand when using hydrated lime. This procedure is as follows:—

(1) Fill spray tank about three parts full of water.

(2) Dissolve required quantity of bluestone in water, add to the spray tank, and start agitator.

(3) Weigh out required quantity of *hydrated lime*, mix to thin paste with water, and with agitator still in motion, pour slowly into spray vat, at the same time filling the tank to capacity with additional water. Keep agitator running for a few minutes, and then apply spray.

No. 2.—Bordeaux Mixture should always be used as soon as possible after preparation. When the two solutions are blended as described in (1) a complex chemical reaction occurs, resulting in the formation of a gelatinous and adherent precipitate. If prepared Bordeaux Mixture is allowed to stand, the precipitate may become granular or crystalline, and this change in its physical nature markedly deteriorates the value of the spray mixture.

No. 3.—*Use of Bordeaux Mixture after Fruit has Set.*

If this spray is used at all after fruit has formed, it should be used at half-strength. Experiments in Victoria showed that half-strength Bordeaux (6-4-80) used after fruit forming reduced the amount of scabby fruit, but resulted in an appreciable percentage of blemished fruit (crimson skin blush).

If possible, spraying should be confined to Bordeaux 12-8-80 (to which may be added 1lb. lime casein spreader per 100galls) in autumn, as final leaves are falling, and again at the pink bud stage in spring. It appears on the available evidence that even half-strength Bordeaux will cause some blemish if applied after fruit formation.

VETERINARY SCIENCE.

Published by Messrs. Bailliere, Tindall & Cox, of 7 and 8, Henrietta Street, London, the fifth edition of "Elementary Veterinary Science" by H. Thompson, M.R.C.V.S., has been revised by A. C. Duncan, F.R.C.V.S., B.Sc., is now available at 10s. 6d. The volume is well-illustrated and is one which should prove most useful to agricultural students, farmers and stockmen.

DEPARTMENT OF AGRICULTURE.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

LEADING SCORES TO WEEK ENDED 27TH *OCTOBER,* 1935.

FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
E. McKee	147	27
H. C. Stacy	143	36
E. McKee	142	29
Trios—		
E. McKee	406	28–30
W. H. A. Hodgson	371	298–300
B. Cooke	362	4–6

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR Summer, 1936.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.

DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

BLACK ORPINGTONS.

EGGS.—10/- per Setting of 15 Eggs. Incubator Lots, £2 per 100.

DAY OLD CHICKENS.—17/6 per dozen; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.

DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

Free on Rail,
Salisbury.

DELIVERY.—CHICKS—January to March.
EGGS—January to February.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

Teams—		
C. R. Wharton	694	127–132
W. Sickert	693	169–174
J. J. Devlin	681	205–210

Class No. 2.—Any other Light Breed.

Singles—		
A. Heaysman (Cuckoo Leghorn)	135	323
Langmaid and Bettison (Black Minorca)	107	321

Class No. 3.—Black Orpingtons.

Singles—		
A. G. Dawes	126	327
K. Pennack	128	340
H. J. Mills	117	335
Trios—		
H. J. Mills	314	331–333
A. P. Urlwyn	268	465–467
K. Pennack	259	337–339
Teams—		
H. J. Mills (only 5 birds)	521	331–336
K. Pennack	517	337–342
H. H. Gallagher	473	343–348

Class No. 4.—Any other Heavy Breed.

Singles—		
H. J. Mills (Rhode Island Red)	152	364
V. F. Gameau (Rhode Island Red)	123	381
Trios—		
K. Pennack (Barnevelder)	338	388–390
V. F. Gameau (Rhode Island Red)	295	379–381
H. J. Mills (Rhode Island Reds) (2 birds only competing)	248	364–366
Teams—		
K. Pennack (Barnevelder)	585	385–390
V. F. Gameau (Rhode Island Reds)	494	379–384
A. G. Dawes (Rhode Island Reds)	456	367–372

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Singles—		
G. R. Cowell	120	391
A. J. Monkhouse	111	402
G. R. Cowell	108	396
Trios—		
A. J. Monkhouse	268	400–402
A. J. Monkhouse	246	397–399
Teams—		
A. J. Monkhouse	514	397–402
G. R. Cowell	405	391–396

Class No. 7.—Black Orpingtons.

Singles—		
W. R. Christie	98	409

Class No. 8.—Any other Heavy Breed.

W. R. Christie (Rhode Island Red)	97	412

SECTION 3.—WET MASH.

Singles—		
Eric Pratt, Abattoirs (White Leghorn)	135	434
Herbert Oliver, McLaren Vale, Black Orpington)	131	442
Peter Western, Ascot Park (White Leghorn)	130	415
Warren Hannaford, Paracombe (White Leghorn)	129	422
Lyol Stone, Morphett Vale (Black Orpington)	128	443
Owen Robinson, Ascot Park (White Leghorn)	125	424
Malcolm Booth, Bridgewater (Black Orpington)	124	445

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive to 27th Oct., 1935.	First Grade Eggs. Totals to 27th Oct., 1935.
B. Cooke, Kanmantoo	1	86	
	2	86	
	3	105	277
	4	110	
	5	129	
	6	123	362
			639
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	121	
	14	—	
	15	137	258
	16	131	
	17	101	
	18	72	304
			562
H. F. Muirson, Yundi.	19	dead	
	20	91	
	21	69	160
	22	82	
	23	126	
	24	58	266
			426
E. McKee, 5, Rose Street, Carrondown.	25	99	
	26	dead	
	27	147	246
	28	135	
	29	142	
	30	129	406
			652
H. C. Stacy, Meadows.	31	80	
	32	78	
	33	137	295
	34	48	
	35	105	
	36	143	296
			591
T. Cleaver, Bridgewater.	37	52	
	38	81	
	39	83	216
	40	116	
	41	76	
	42	94	286
			502
C. Sandstrom, Yundi.	43	100	
	44	dead	
	45	dead	100
	46	65	
	47	63	
	48	117	245
			345
A. J. Monkhouse, Woodside.	49	60	
	50	131	
	51	113	304
	52	131	
	53	74	
	54	105	310
			614
J. F. Smith, Meadows.	55	99	
	56	92	
	57	7	198
	58	78	
	59	12	
	60	118	208
			406
A. Young, Bridgewater.	61	124	
	62	108	
	63	102	334
	64	72	
	65	129	
	66	100	301
			635
R. W. McAlister, Yundi.	67	57	
	68	92	
	69	111	260
	70	78	
	71	49	
	72	102	229
			489
T. Duhring, Mallala.	73	130	
	74	dead	
	75	84	214
	76	54	
	77	66	
	78	80	200
			414
R. J. Underdown, Meadows.	79	42	
	80	71	
	81	128	241
	82	87	
	83	74	
	84	120	281
			522
S. Hill, Bridgewater.	85	82	
	86	123	
	87	108	313
	88	117	
	89	124	
	90	101	342
			655
W. R. Hedger, Yundi.	91	69	
	92	86	
	93	92	247
	94	94	
	95	70	
	96	94	258
			505

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals 27th Oct., 1935.	
Langmaid & Bettison, **Salisbury.**	97	74	
	98	51	
	99	73	198
	100	113	
	101	61	
	102	2	176
			374
E. Portlock, **Meadows.**	103	130	
	104	106	
	105	114	350
	106	92	
	107	81	
	108	106	279
			629
Murray Powell, **Jupiter Creek.**	109	132	
	110	45	
	111	114	291
	112	88	
	113	137	
	114	36	261
			552
G. W. Bignell, **Meadows.**	115	116	
	116	89	
	117	88	293
	118	73	
	119	117	
	120	118	308
			601
W. M. Field, **Yundi.**	121	102	
	122	28	
	123	86	216
	124	63	
	125	65	
	126	117	245
			461
C. R. Wharton, **Meadows.**	127	106	
	128	115	
	129	127	348
	130	127	
	131	110	
	132	109	346
			694
H. H. Hefford, **Murray Bridge.**	133	92	
	134	124	
	135	107	323
	136	46	
	137	124	
	138	82	252
			575
F. W. Gage, **Meadows.**	139	94	
	140	4	
	141	dead	98
	142	111	
	143	81	
	144	75	267
			365
W. H. L. Norman, **Echunga.**	145	77	
	146	62	
	147	—	139
	148	132	
	149	90	
	150	56	278
			417

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.	
B. R. Whittington, **Yundi.**	151	105	
	152	62	
	153	90	257
	154	114	
	155	105	
	156	84	303
			560
B. C. Sanders, **Meadows.**	157	114	
	158	124	
	159	127	365
	160	112	
	161	52	
	162	dead	164
			529
H. H. Gallagher, **Pooraka.**	163	48	
	164	95	
	165	102	245
	166	78	
	167	54	
	168	116	248
			493
W. Sickert, **Meadows.**	169	137	
	170	83	
	171	127	347
	172	96	
	173	117	
	174	133	346
			693
W. Restall, **Echunga.**	175	60	
	176	—	
	177	84	114
	178	112	
	179	97	
	180	104	313
			457
A. G. Dawes, **230, Portrush Road,** **Glenunga.**	181	121	
	182	94	
	183	91	306
	184	69	
	185	68	
	186	120	257
			563
G. W. Sykes, **Yundi.**	187	113	
	188	70	
	189	61	244
	190	81	
	191	78	
	192	116	275
			519
R. Bartley, **Meadows.**	193	76	
	194	132	
	195	100	308
	196	77	
	197	102	
	198	116	295
			603
A. & H. Gurr, **Mindaroo Poultry Farm,** **Bradbury.**	199	66	
	200	91	
	201	68	225
	202	103	
	203	73	
	204	75	251
			476

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive to 27th Oct., 1935.	Totals to 27th Oct., 1935.
J. J. Devlin, Meadows.	205	108	
	206	105	
	207	138	351
	208	109	
	209	85	
	210	136	330
			681
D. J. Foxwell, Echunga.	211	109	
	212	87	
	213	39	235
	214	17	
	215	102	
	216	39	158
			393
F. J. Buck, Meadows.	217	102	
	218	111	
	219	140	353
	220	78	
	221	93	
	222	83	254
			607
J. A. Grist, Yundi.	223	22	
	224	55	
	225	86	163
	226	36	
	227	—	
	228	90	126
			289
L. A. King, Meadows.	229	124	
	230	112	
	231	dead	236
	232	18	
	233	72	
	234	19	109
			345
R. W. Sando, Echunga.	235	92	
	236	64	
	237	71	227
	238	92	
	239	83	
	240	72	247
			474
E. W. Young, Meadows.	241	125	
	242	104	
	243	99	328
	244	101	
	245	—	
	246	55	156
			484
A. Jarvis, Yundi.	247	94	
	248	56	
	249	81	231
	250	106	
	251	85	
	252	136	327
			558
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12

Competitor.	Bird No.	First Grade Eggs. Progressive to 27th Oct., 1935.	Totals to 27th Oct., 1935.
S. Bridge, Yundi.	259	105	
	260	120	
	261	100	325
	262	56	
	263	104	
	264	92	252
			577
H. G. Egarr, Meadows.	265	98	
	266	80	
	267	25	203
	268	18	
	269	99	
	270	41	158
			361
R. H. Smith, Yundi.	271	110	
	272	79	
	273	105	294
	274	126	
	275	41	
	276	110	277
			571
J. M. Lawson, Meadows.	277	118	
	278	120	
	279	93	331
	280	68	
	281	108	
	282	61	237
			568
J. O. Marshall, Yundi.	283	12	
	284	100	
	285	110	222
	286	118	
	287	113	
	288	77	308
			530
G. Joyce, Meadows.	289	13	
	290	140	
	291	68	221
	292	83	
	293	125	
	294	90	298
			519
J. A. Bradtke, Yongala.	295	11	
	296	—	
	297	97	
		108	
W. H. A. Hodgson, Salisbury.	298	133	
	299	116	
	300	122	
		371	
A. W. McDonald, Gawler.	301	53	
	302	97	
	303	102	
		252	
J. H. Dowling, Glossop.	304	88	
	305	117	
	306	21	
		226	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.	
A. P. Urlwin, Balaklava.	307	92	
	308	77	
	309	18	
		187	
L. S. Ekers, Mount Compass.	310	103	
	311	29	
	312	116	
		248	
V. E. Williams, Semaphore Park.	313	119	
	314	119	
	315	121	
		359	
F. P. Munzberg, Tanunda.	316	120	
	317	107	
	318	121	
		348	
Total Class 1		26,586	
Class 2 —Any Other Light Breed.			
Langmaid & Bettison, Salisbury. (Black Minorcas.)	319	87	
	320	61	
	321	107	
		255	
A. Heaysman, Government Road, Eden Hills. (Cuckoo Leghorns.)	322	99	
	323	135	
	324	64	
		298	
Total Class No. 2		553	
Class No. 3—Black Orpingtons.			
A. G. Dawes, 230, Portrush Road, Glenunga.	325	49	
	326	25	
	327	126	200
	328	71	
	329	75	
	330	95	241
			441
H. J. Mills, 108, Edward Street, Edwardstown.	331	116	
	332	100	
	333	98	314
	334	90	
	335	117	
	336	dead	207
			521
K. Pennack, Pooraka.	337	115	
	338	96	
	339	48	259
	340	128	
	341	53	
	342	77	258
			517
H. H. Gallagher, Pooraka.	343	100	
	344	75	
	345	83	258
	346	105	
	347	82	
	348	28	215
			473

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.	
B. Cooke, Kanmantoo.	349	24	
	350	36	
	351	26	
		86	
H. H. Hefford, Murray Bridge.	352	101	
	353	67	
	354	52	
		220	
J. H. Dowling, Glossop.	355	71	
	356	33	
	357	102	
		206	
L. S. Ekers, Mount Compass.	358	85	
	359	64	
	360	106	
		255	
A. G. Dawes, 230, Portrush Road, Glenunga.	452	60	
	453	86	
	454	81	227
	455	10	
	456	105	
	457	95	210
			437
A. P. Urlwin, Balaklava.	465	75	
	466	105	
	467	88	
		268	
Total Class No. 3		3,424	
Class No. 4.—Any Other Heavy Breed.			
H. J. Mills, 108, Edward Street, Edwardstown. (Rhode Island Reds.)	361	1	
	362	dead	
	363	63	64
	364	152	
	365	96	
	366	dead	248
			312
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	367	71	
	368	87	
	369	62	220
	370	99	
	371	60	
	372	77	236
			456
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens. (Rhode Island Reds.)	373	98	
	374	116	
	375	dead	214
	376	29	
	377	85	
	378	87	201
			415
V. F. Gameau, Findon Road, Woodville. (Rhode Island Reds.)	379	55	
	380	117	
	381	123	295
	382	96	
	383	24	
	384	79	199
			494

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.	
K. Pennack, Pooraka. (Barnevelders.)	385	93	
	386	85	
	387	69	247
	388	117	
	389	104	
	390	117	338
			585
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	458	15	
	459	83	
	460	98	196
	461	15	
	462	88	
	463	90	193
			389
Total Class No. 4			2,651

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.	
G. R. Cowell, Balhannah.	391	120	
	392	50	
	393	26	196
	394	62	
	395	39	
	396	108	209
			405
A. J. Monkhouse, Woodside.	397	38	
	398	107	
	399	101	246
	400	65	
	401	92	
	402	111	268
			514
G. R. Cowell, Balhannah.	403	102	
	404	93	
	405	46	241
	406	89	
	407	60	
	408	dead	149
			390
Total Class No. 5			1,309

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.
W. R. Christie, Upper Mitcham.	409	98
	410	74
	411	81
		253
Total Class No. 7		253

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	97
	413	39
	414	79
		215
Total Class No. 8		215

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.
Peter Western, Ascot Park School. (White Leghorn.)	415	130
Peter Western, Ascot Park School. (White Leghorn.)	416	120
William Sando, Echunga School. (White Leghorn.)	417	104
Douglas Marshall, Yundi School. (White Leghorn.)	418	109
Norman Page, Murray Bridge School. (White Leghorn.)	419	105
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	99
Dean Colwell, Grange School (White Leghorn.)	421	87
Warren Hannaford, Paracombe School. (White Leghorn.)	422	129
W. Horne, Woodville School. (White Leghorn.)	423	dead
Owen Robinson, Ascot Park School. (White Leghorn.)	424	125
June Chapman, Woodchester School. (White Leghorn.)	425	84
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	81
Jack O'Sullivan, Morphett Vale School. (White Leghorn.)	427	107
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	55
James Taylor, Morphett Vale School. (White Leghorn.)	429	105
William Gregory, Victor Harbour School. (White Leghorn.)	430	88
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	81
Clifford Burford, Smithfield School. (White Leghorn.)	432	60
Tom Callaghan, Smithfield School. (White Leghorn.)	433	18
Eric Pratt, Abattoirs School. (White Leghorn.)	434	135
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	117
Alan Yelland, Cunliffe School. (Minorca.)	436	67
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	112

Egg-laying Competition—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 27th Oct., 1935.
Clarence King, Tarlee School. (White Leghorn.)	438	60
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	103
Donald Heading, Sturt School. (Black Orpington.)	440	117
Clive Steer, Sturt School. (Black Orpington.)	441	109
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	131
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	128
Ray Candy, Noarlunga School. (Black Orpington.)	444	51
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	124
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	107
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	24
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	66
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	118
John Keldoulis, Orroroo School. (Black Orpington.)	450	106
Bruce Dooland, Thebarton School. (Black Orpington.)	451	76
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	62
Total		3,500

FEEDING TESTS AT PARAFIELD POULTRY STATION

[New Series of Tests by C. F. Anderson, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April to 30th June.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 30th Sept. 1935.	No. Eggs Laid Month of October, 1935.	Total Eggs Laid 1st April, 1935, to 31st October, 1935.
No. 1 Test	3,507	880	4,387
No. 2 Test	3,553	851	4,404
No. 3 Test	3,662	884	4,546
No. 4 Test	3,124	847	3,971
No. 5 Test	3,079	842	3,921

AGRICULTURE IN THE TEMPERATE AND SUB-TROPICAL CLIMATES OF THE SOUTH.

[*A Report by the Deputy Director of Agriculture (W. J. Spafford) to His Excellency Sir Winston Dugan, K.C.M.G., C.B., D.S.O., Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia. Mr. Spafford took a brief tour* of portions of the principal agricultural countries in the same climatic zones as the settled portions of Australia, in fulfilment of the appointment as Honorary Commissioner, conferred upon him by His Excellency, to inquire into and report upon the Production and Preparation for Marketing of Agricultural Products, including Crops and Livestock in South America, South Africa, and New Zealand.*]

ARGENTINA.

(Continued from page 387.)

CATTLE IN ARGENTINA.

At present the best beef cattle in the world are produced in enormous numbers in Argentina, but this was not always so. Away back in 1553 there were introduced from Brazil to Paraguay, which was then part of the River Plate, seven cows and one bull, and from then onwards several small lots were brought into the country, until the definite founding of Buenos Aires in 1580 when 300 cows were taken to the locality. Again in 1588 a herd of 3,000 head was taken to the Corrientes, and these, like the previous lots, consisted of descendants of the Iberian cattle brought out from Spain by the early expeditions, and large numbers

Stud Shorthorn Cows with Calves at Foot on an Estancia in Argentina. Shorthorns are easily the most important breed of cattle in Argentina, the pure-breds of the breed constituting 80 per cent of all pure-breds, and over 56 per cent. of the total cattle of the whole country. Very high-class animals of the breed are to be found throughout the cattle-breeding districts, and cows of the quality shown above are by no means unusual.

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*Tour made in the company of Col. C. P. Butler ("Yattalunga," of the *Advertiser* of this type are still to be found in various localities in South America, but more particularly in the hotter localities in the north. During the wars which raged for so long after these cattle were introduced they went wild, and bred up very rapidly on the Great Plain extending from Buenos Aires to the Chaco, and for many years did not appear to deteriorate to any great extent, but eventually it was noticed that they were getting smaller as their numbers increased. An estimate of the cattle on the Great Plain in 1780 gave the figure as 48,000,000 head, most of which were wild, but as the only part of these animals of much value—the hide—became increasingly valuable they were freely killed so as to export the hides to Spain, and to such purpose that by the end of the 18th century the herds were reduced to 6,500,000 animals. To allow the wild cattle to breed up, the authorities periodically refused to grant licences to ship hides, and this appears to have had the desired effect. During this period, and until the middle of the 19th century, cattle were the principal source of wealth of the country, and the export trade in hides and fat was the main business of the time.

British bred Shorthorn Bulls used in a Stud on an Estancia in Argentina. Long, deep, low-set bulls are very popular in Argentina, and prove the ideal type for the production of the rapid-maturing, sappy baby-beef desired by the British market.

In the early part of the 19th century the production of salted meat for export was encouraged so as not to leave the carcasses wasting on the land after the hides were removed, and some progress was being made in this direction by 1882, when the first frigorifico was established in the country. The successful freezing of beef for export completely changed the outlook for cattle-raisers, and from that time very rapid progress in the production and improvement of the cattle of Argentina has taken place. The discovery that beef merely chilled could be transported with safety to Europe from Argentina also helped on the industry, and another factor of great importance in connection with the improvement of the beef-producing breeds of cattle has been the holding of Cattle Shows with regularity at Palermo for a great many years. The first Palermo Show was held in 1858, and was organised by Don Gervasio A. de Posadas.

The Cattle-producing Districts.

Most of the cattle of Argentina are produced in the very good agricultural districts of the country, for, of the total of 32,211,855 shown to be present in the 1930 census, 11,639,442 were in the Province of Buenos Aires, 3,832,556 in Corrientes, 3,641,804 in Santa Fé, 3,074,697 in Córdoba, and 2,534,729 in the Province of Entre Rios. In these localities the soils are good, the rainfall plentiful and well distributed, and the climate equable, and so natural and established pastures flourish, cattle need no housing, and continuity of supplies of animals is ensured. That there is very little difference in the supply of cattle from month to month can be seen by the number of animals slaughtered at the frigorificos, most of which are for export:—

Monthly Slaughterings at Frigorificos in 1933.*

	Per cent.		Per cent.
January	9.2	July	8.5
February	7.6	August	8.5
March	8.7	September	8.4
April	7.8	October	8.2
May	8.1	November	8.0
June	7.9	December	9.1

* "Cattle and Beef Survey" of Imperial Economic Committee—June, 1934.

Type of Shorthorn Cows maintained in Argentina for the production of Baby-beef Big, roomy pure-bred Shorthorn cows are mated to low-set Shorthorn bulls to produce the baby-beef steers for which Argentina is justly famous Hundreds of thousands of steers in the primest of condition, weighing 1,100lbs. and over by the time they are 2 years of age, are produced annually, and mostly from cows such as those illustrated.

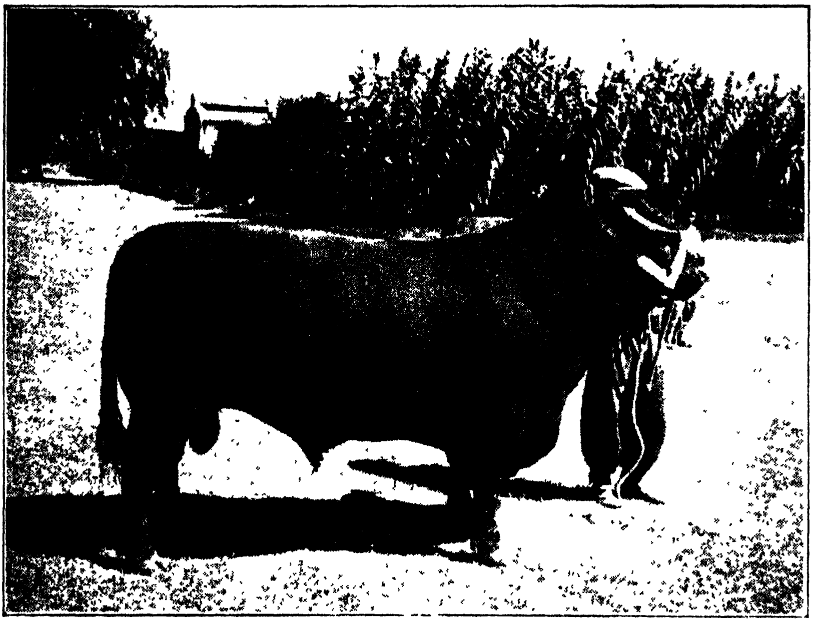
The Breeds of Beef Cattle.

Of the 32,211,855 animals (including milch cows) recorded at the 1930 census, the breeding of 9,274,994 was not specified, but of the others (22,936,861) 18,109,465 were Shorthorns, 2,786,064 Herefords, 1,256,189 Aberdeen-Angus, and 12,121 Red Polled, and a few Sussex, Devon, Zebu, and West Highland. Quite a considerable proportion of the animals of which the breeding is not shown must be direct descendants of the original importations, and will be located right in the north of Argentina. In the better districts the Shorthorn is supreme, and the conditions are certainly ideal for the rapid development of the animals of this breed. In those districts where Cattle Tick are found, but are not too bad, the

Hereford does quite well, and the Aberdeen-Angus is holding its own. Most cattlemen in Argentina, whether from estancias, frigorificos, or saleyards, dislike Zebu cattle and their crosses, but although it is generally recognised that Zebu types would never be kept where better breeds will do well, there are some places where this breed does better than others. Argentina is fortunate in that the area in the north where British breeds of cattle do not thrive is very limited indeed, and in this small area Spanish cattle and Zebu crosses are maintained with advantage.

Management of Cattle in Argentina.

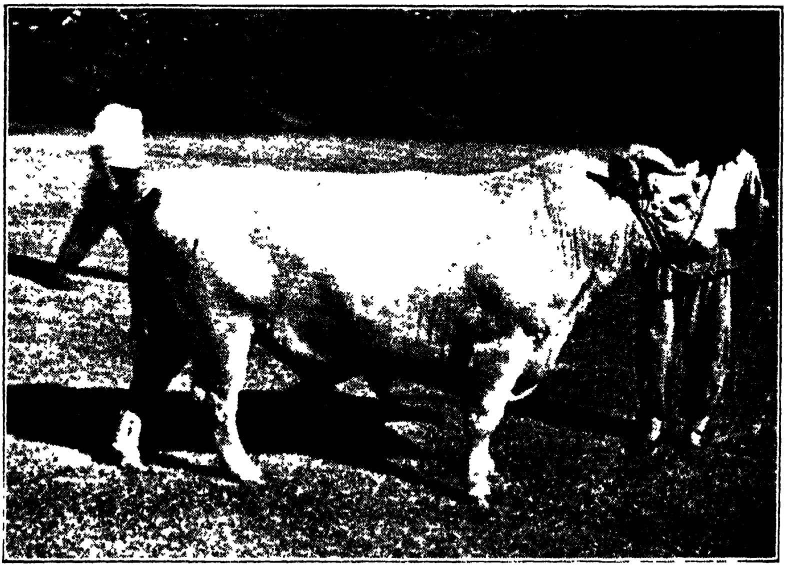
It is common experience in Argentina that if the desired low-set, rapid-maturing type of cattle is to be maintained it is necessary to introduce frequently top-sire bulls from Great Britain, whether the breed be Shorthorn, Hereford, or Aberdeen-Angus. Some breeders go so far as to use nothing but imported bulls in their studs, whilst others are content to secure such bulls every second generation or so. The conditions in which the trade cattle are raised are almost ideal for the purpose, but are quite dissimilar to those obtaining where the principal breeds of beef cattle were developed. The change from cold-temperate to sub-tropical climate tends to favour rapid development, and for the same reason tends to change the low-set round-barrelled type so necessary for the production of baby-beef to something taller and narrower, thus necessitating frequent importations of the original stock to keep the herds to type.



A High-quality Imported British-bred Shorthorn Bull used in a stud in Argentina for the production of low-set bulls to sire baby-beef steers.

Large numbers of beef cattle, mainly bulls, are imported into Argentina annually, and the greatest possible care is exercised to prevent the introduction of diseases into the country. A large, well equipped, and hygienically maintained quarantine station is located on a spacious site on the wharf at Buenos Aires, and no imported animal is allowed away from this institution until all necessary tests have been made and until the specified time for detention has elapsed. In times when much disease is about, or when large numbers of animals are being attended to, or on any occasion when it is essential to keep people from the quarantine station, sailors from the Navy are put on guard, and whenever this has been done there has not been a case of an unauthorised person getting into the institution.

Although the natural pastures of the cattle country are fairly good, much better results are secured from sown pastures. Lucerne is easily the most important of the forage plants used, and it is the only one that persists for a number of years. Of the annuals, Rye and Oats are sown in the autumn, and make strong early winter growth, and are looked upon with much favour by cattle-men because they are almost ideal on which to put freshly weaned calves. Forage Sorghum and Sudan grass are grown in the summer, and on these crops steers top up quickly, particularly if they get the run of a Lucerne field at the time they are on the Sorghum. Of the introduced forage plants which appear without sowing *Cynodon dactylon* (Couch or Bermuda grass) and *Bromus unioloides* (Prairie grass) are the most prevalent and the most useful. Couch grass tends to choke out the Lucerne, and is difficult to eradicate, but where better plants are not desired provides a great bulk of fattening forage. The Prairie grass is much appreciated by stockmen, for when a fair sprinkling of it is present in the Lucerne stands cattle do very much better than when it is absent.

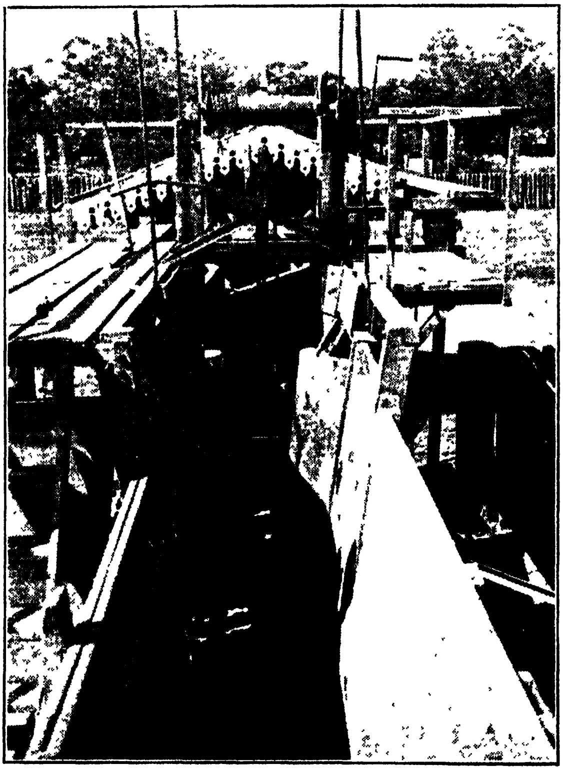


White Shorthorn Bull, as used in Argentina for colour mating. Rich ruby-red Shorthorns are very popular in Argentina, but most breeders produce all of the usual Shorthorn colours, endeavouring, however, to keep them free from washiness by mating red bulls to roan cows and roan bulls to red cows, and also to get a proportion of rich roans by mating white bulls to deep-red cows.

In the great majority of seasons plenty of rain is received and it is well distributed, still an occasional season occurs in which the pasture growth is poor. This is easily guarded against, because in most years the growth is very luxuriant, and a great many cattle-raisers store hay and silage against these years of shortage. When silage is to be made the first growth of the Lucerne crops, which usually contains some weeds, is taken, and later cuts, which are cleaner, are converted into hay.

Because of the very early maturing of the cattle, it is necessary to mate the heifers whilst still young, otherwise too great a proportion of them prove sterile. When about 15 months old the heifers are put to the bull, and if they miss for the autumn calving, are tried for the spring calving, and should they fail both times they are topped up for slaughter.

It is usual to have two calvings in the better parts of the cattle country—one in autumn and the other in spring, otherwise it appears difficult to secure a sufficiently high percentage of calves, and continuity of supplies could not be maintained. Most managers favour the autumn drop because the calves get no check at weaning, particularly if put straight on to Rye or Oats sown for the purpose.



Crush Pen on an Estancia in Argentina An important part of the equipment of estancias, where thousands of cattle are maintained, is the crush pen. The illustration shows a rather elaborate type of crush pen used in many parts of the country. The operator, who stands upon a platform above the beast, has several levers to control gates, bail, and two semi-cylindrical pillars, which press into the flanks of the animal. When the beast is held in the crush the gates at head, sides and tail can be opened, so that every part of the animal is get-at-able except the small area of skin covered by the flank pillars. A hand winch is also provided on the platform for raising the head of the beast, or even lifting an animal that gets down.

Weaning of calves is rarely done early, and the calves are generally nine months old before being removed from their mothers, and some go so far as to leave the calf with the cow until she calves again, knowing that the older one will be discarded for the new arrival.

It is frequently necessary to bring the cattle into the homestead yards to attend to them when troubled with Foot-and-Mouth disease and for dipping, and advanage is taken of these occasions by some managers to reclassify the mobs of fattening animals. As a weighbridge is usually part of the estancia equipment, some cattle-men do their classifying according to weight, the result being almost perfectly matched mobs developing at about the same rate as each other.

Because of the added attractiveness of good colours a great deal of attention is given to this phase of breeding of beef cattle in Argentina. Some cattle-men are concentrating on rich ruby-red Shorthorns, and are gradually eliminating animals of other colours; but most breeders are retaining all colours, but are endeavouring to keep them free from washiness by putting red bulls on roan cows, roan bulls on red cows, and to keep up the proportion of rich roans put white bulls on deep-red cows.

All steers on almost every estancia are dehorned as calves, and generally with a knife, rather than with caustic or with calf-dehorner. Buyers of cattle for export as chillers will not look at steers with horns, but for home consumption and for canning their presence does not appear to make much difference. On many properties heifers which are going to the stud are the only animals not dehorned, whilst some leave horns on all females, only removing them from steers. If the percentage rejects of chillers is to be kept at a low figure, dehorning is essential, and particularly so where the animals have to be brought some distance by rail or road to the slaughter-house.

Diseases and Pests of Cattle.

Although Argentina has such good cattle-raising conditions, cattle-raisers have considerable trouble with diseases and pests, the worst of which are Foot-and-Mouth disease and Cattle Tick, but they also have to contend with Anthrax, Tuberculosis, Scours (Enteque), Actinomycosis, and Blowfly.

Because of the insistence of Great Britain—the principal purchaser of Argentine beef—the inspection of cattle sold for export is particularly strict, and animals arriving at a frigorifico without a certificate from a veterinary officer stating that they were free from disease when they left the estancia, are killed for home consumption or canning, or are returned to the owner. They undergo another inspection immediately before slaughter, and all portions of the carcasses are carefully inspected whilst being dressed.

Foot-and-Mouth disease is a constant source of worry to cattle-men, for in many districts two outbreaks a year are to be expected, and the loss of condition of the animals during the attacks, the cost of inspection at selling time, the restrictions on movements of stock from one locality to another, and being kept out of overseas markets, such as the United States of America, are all handicaps. On the other hand, loss by death is light, and where the pastures are really good the animals recover quickly and soon put on condition. A development in connection with Foot-and-Mouth disease which is making the position more serious for cattle-men is that Blowflies are becoming increasingly troublesome, and strike the animals as soon as the disease leads to the breaking of the skin. Whilst the Blowflies are troublesome, a careful watch must be kept on the animals, and it is frequently necessary to lasso and throw animals and treat the affected parts with a liquid which will lead to the expulsion of the maggots.

In common with other beef-exporting countries, Tuberculosis is the cause of a good deal of the rejecting of meat for export, but it is no worse in this country than in others, and as a matter of fact, considering how large is the proportion of highly-bred, quick-maturing animals in the herds of Argentina, the disease is not as bad as might be expected. Great care is taken at the quarantine station to prevent the entry of cattle with Tuberculosis, and the meat inspection in the frigorificos is very thorough indeed.

Anthrax occurs in some of the cattle districts of Argentina, but is kept in check by one, or at most two, vaccinations a year.

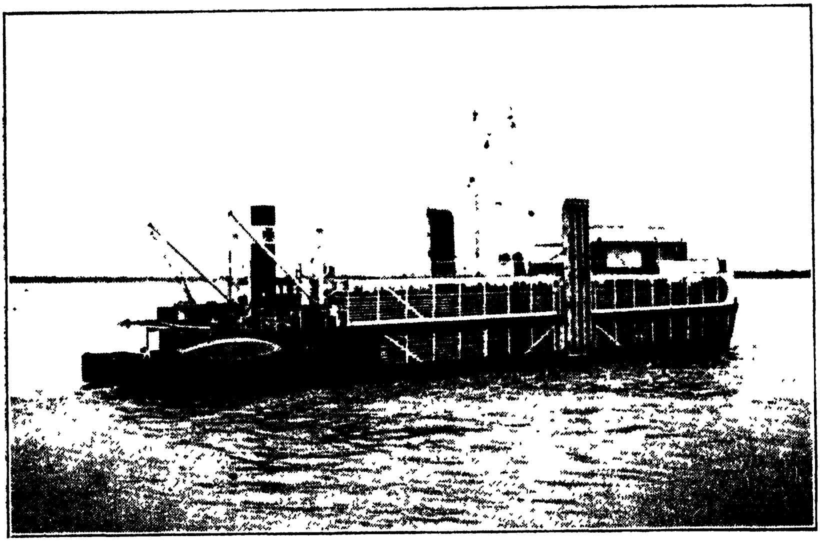
A very severe form of Scours, known in the country as Enteque, the origin and cause of which is not known, leads to a considerable loss amongst cattle, particularly to young stock brought from rougher pastures on to fresh succulent Lucerne. Some of the animals die, but the majority lose condition rapidly and become very emaciated; and although most of them recover, few of them appear to make full development after a severe attack. The estancias suffering least from this trouble appear to be those that gradually accustom stock from outside to the pastures, keep their whole places clean and tidy, and prevent the formation of waterholes in which the cattle can wallow.

In much of the cattle country of Argentina Cattle Tick need constant attention, and as the Government is gradually pushing the pest from the south, stringent regulations for its control exist and are strictly enforced. Within the barrier zone a chain of inspectors is stationed, and cattle cannot be sent south of a fixed line unless inspected within 48 hours of shipment, and from north of the line all animals reaching a frigorifico must be slaughtered within 24 hours. The frequent dipping of the animals in Tick-infested areas tends to make them as quiet as dairy cows: for portion of the year it is necessary to dip every three weeks at least, and every six weeks for the remainder of the year.

Treating a Fly-blown Calf on an Estancia in Argentina When Foot-and Mouth disease leads to the breaking of the skin of cattle during the warmer parts of the year the animals are frequently struck by blow-flies at the spot, and immediate attention is necessary to prevent serious damage being done to the beast.

Transport of Cattle.

Except from the far north of Argentina, most cattle sold for slaughter, whether for export or home consumption, do not have to be travelled the great distances common in some other countries, nevertheless very few if any are reared right alongside of the killing works. The conditions of the country are such that most cattle-men prefer to send the fat animals by some sort of conveyance rather than make them walk to market, and for the purpose railway trains and cattle boats are utilised. Cattle trains consist of trucks with doors in the ends, and when these doors are opened the whole train is like a long corridor, and cattle being loaded can walk from the loading end to the front of the train. Cattle-men and railway-men prefer these end openings, and the only serious objections raised to them is the difficulty of disinfection, and the awkwardness when several small mobs of cattle are to be taken on the one train. In the effort to keep down diseases it is obligatory on the railway authorities to see that all trucks used are thoroughly disinfected, and on appearances this is carried out thoroughly.



Cattle Boat Used in Argentina for the Transport of Cattle to Killing Works. Specially constructed for the purpose, many of these boats are commodious and well-equipped. The illustration depicts one of the boats belonging to Argentine Estates of Bovril Limited, which bring cattle from the north, and are fitted with showers to keep cool water sprayed on the animals, and are provided with strong fans to keep the air moving.

A Mob of some Thousands of Dehorned Shorthorn Steers, about 2½ years of age, on an Estancia in the Tick-infested Areas of Argentina. Buyers of export cattle insist on the dehorning of the animals, and if carrying horns they can only be sold for local requirements, canning, or meat extract.

Quite a big proportion of cattle for slaughter are brought into frigorificos or markets in cattle boats, and some of these, notably those owned by Argentine Estates of Bovril Limited, are really large and conveniently equipped. Those bringing cattle from the north are fitted with showers to keep cool water sprayed on the animals, and are provided with strong fans to keep the air in circulation.

Cattle are carried very well in Argentina, as is to be expected when practically all of them are without horns, when so many are brought by water, and when trains have so much level country to run on. Bad bruises are exceptional on cattle bought for export, and it is generally conceded that this is due very largely to the absence of horns.

From figures supplied it appears that young chillers trucked 250 miles or so to Buenos Aires lose about 8 to 10 per cent. of their weight during transit if loaded in the morning the train leaves, and about 2 per cent. more if loaded the afternoon before.

Purchasing the Cattle.

Cattle are purchased at saleyards and at frigorificos by live weight. When animals are offered by auction, buyers bid in centavos or fractions per kilo live weight, and as in most cases the animals had passed over the weighbridge before being sold, buyers know exactly what they are bidding for. For steers for export most of the purchasing is done by negotiation on the estancias, and payment is made on the live weight of the animals when they reach the frigorifico. In the saleyards most of the beef cattle are bought without putting them up for auction, or as is usually stated in Argentina, "by ear," and so even when there is a big yarding the auctions are relatively few, and do not occupy a great deal of time.

A Cattle Sale in Progress in the Buenos Aires Cattle Sale Yards. Practically all work in these sale yards is done on horseback, there being over 1,000 saddled horses in the yards throughout the period of the sale. Besides the moving of cattle being controlled by horsemen, all branding is done from horseback, and nearly all buyers are mounted, and make their bids from this position.

The cattle saleyards in Buenos Aires are conducted in a manner quite dissimilar to anything in Australia and a visit on a sale day proves very interesting. Practically all work in connection with cattle is done on horseback, there being over 1,000 saddled horses in the yards throughout the progress of the sale. Groups of cattle are constantly being moved by horsemen, and as the yards and roadways are cemented, the job is difficult, but the horses are well-trained and particularly surefooted. Beasts frequently fall, but although the horses gallop, twist, and turn, frequenters of the market affirm that it is only occasionally that a horse slips over. The branding of cattle is done from horseback, and many branders are to be seen with a paint-pot hanging from the saddle for the purpose. Most of the cattle-buyers are on horseback, and while the auctioneer walks along a platform above the cattle calling the bids, the buyers ride along the roadway on the side of the pens opposite to the auctioneer, and give their bids. The provision of wide roadways alongside all cattleyards means that an enormous area of land is necessary for a cattle saleyards.

A few English-type saddles are used by horsemen in the saleyards, but most of them are the true South American type, with several layers of sheepskins and somewhat like a feather bed, and quite a noticeable proportion are without stirrups. None of the bridles have throat, nose, or chin strap, and quite a number of the horses are ridden without a bridle, but with a piece of rope, greenhide, or chain tied tightly through the mouth and around the bottom jaw, with two reins attached under the jaw. The stock-horses are of very good type and are maintained in excellent condition. No whips are used in the yards except the riding whip common to the country.

Slaughtering Cattle.

Although there has been a great reduction in recent years in the number of cattle slaughtered, and the amount of beef exported and consumed locally, the yearly handlings are still very considerable.

*Reduction in Beef Production in Argentina.**

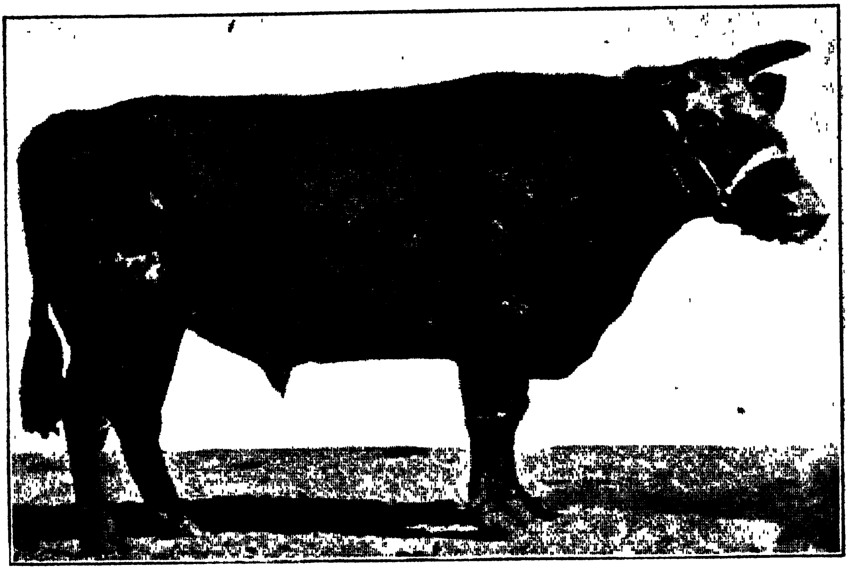
	1925.	1932.
	Tons.	Tons.
Production at slaughter houses, salting establishments, and meat-producing works (estimated)	1,028,200	838,300
Production at Frigorificos	857,200	632,000
Total production (*a*)	1,885,400	1,470,300
Less exports (including preserved meat) ..	738,200	444,300
Available for local consumption (estimated).	1,147,200	1,026,000
Per capita consumption (estimated)	255lbs.	204lbs.

(*a*) Excluding farm production. An unofficial estimate gives farm slaughterings of cattle at 1,000,000 head per annum, and on this basis, nearly 200,000 tons of beef would be available for consumption on farms, adding about 40lbs. to the per capita consumption of the whole country.

* "Cattle and Beef Survey" of Imperial Economic Committee—June, 1934.

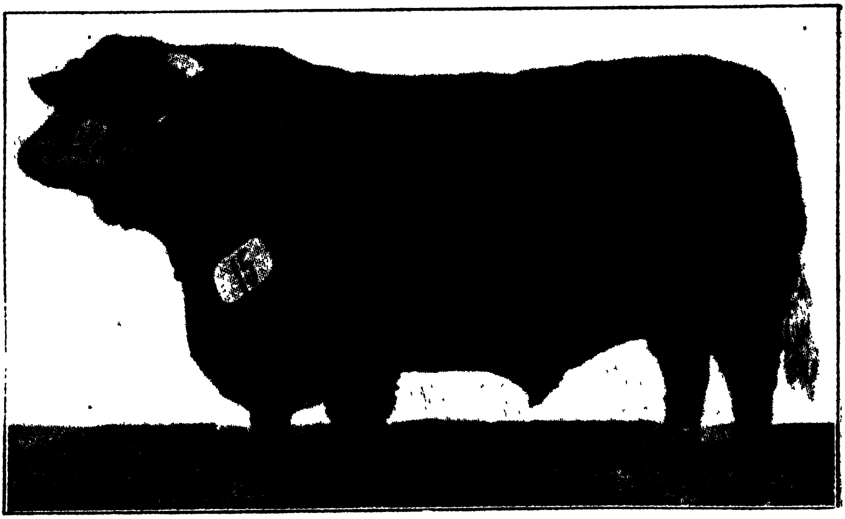
NOTE.—In translating the table into English a tonelada was taken at 0.9842 ton.

It is in the frigorificos that all cattle for export are slaughtered, and most of these are equipped with modern plant and are conducted on efficient and hygienic lines. As soon as cattle arrive at a frigorifico, whether it be by rail, boat, or on foot, they are inspected by a veterinary officer and then passed over a weighbridge, and if free from disease are placed in yards with feed and water, and in many cases under a roof, in that portion of the frigorifico yards set aside for sound animals. If not fit for export they must be kept in that part of the yards used for cattle for local consumption only. When to be slaughtered the cattle are



[From *Buenos Aires Herald.*

Champion Shorthorn Bull at the Palmero (Buenos Aires) Cattle Show in 1875. Vast strides have been made in the improvement of beef cattle in recent years, and a present-day champion is a different looking animal than the one illustrated above.



[From *Buenos Aires Herald.*

Champion Shorthorn Bull at the Palermo (Buenos Aires) Cattle Show in 1934. So much improvement has taken place with this breed that typical animals of to-day show greater differences to the type of 60 years ago than are noticeable between distinct breeds of beef cattle. A glance at the preceding illustration will show how great has been the change in type.

passed through a large swimming bath, and are afterwards held for some time under shower baths, the water being used to cool down the animals and to remove dirt which might make it more difficult to keep the meat clean during dressing. From the baths the cattle are driven quietly up the steep ramp to the killing floor. All movement of cattle in the yards is done without dogs or whips, so that the risk of fresh bruises is reduced to a minimum, and only noise and the electric switch are allowed as aids in driving.

The killing is done with sledge-hammer, and it is a very rare occurrence for it to be necessary to use more than the one blow. The carcass is then picked up by hind legs with a crane, knifed, and slowly travels to a shallow trough into which it is dropped on its back for the skinning of the belly-line, and the removal of the legs at knees and hocks. In some places the trough to catch the blood, over which the carcass travels before skinning starts, is walled off from the rest of dressing floor, and by the time the carcass reaches the skinners most of the blood has left it and is away from other offals. After butchers have skinned along the underline the carcass is again picked up by crane and is attached to a travelling chain which it does not leave until hung in the cooling chambers, if for export or local consumption as fresh meat, or if being canned or used for meat extract it does not leave the chain until every bit of meat has been removed from the bones. All of the work of dressing the carcasses is done by knife, except the splitting of the carcasses into two, where very efficient and easily handled electrically-driven hand saws are used.

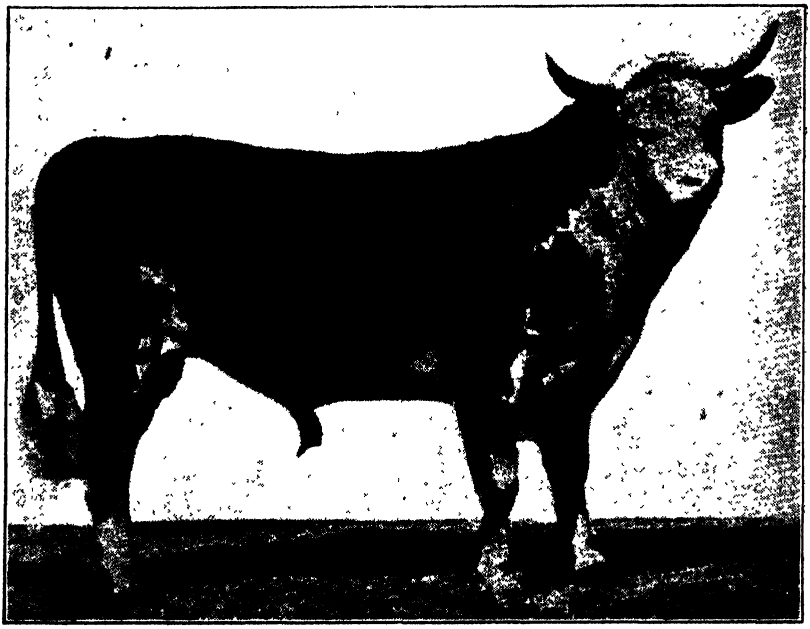
The hides are a very valuable part of the carcass, particularly at the northern canning and meat-extract works, where quite a lot of Criolla cattle are slaughtered. These Criolla cattle are the direct descendants of the original Iberian cattle, and although not good beef animals like the British breeds, are suitable for canning and meat-extract, and have particularly thick and valuable hides. Great care is taken to keep the hides undamaged, and on removal they are closely examined for knife marks, and the slightest mark made by a skinner is recorded against him according as whether it is slight, fairly serious, or right through the skin, and the punishment consists in putting offenders off for periods varying with the severity of the damage. The butchers in Argentina are very skilful with the knife, and cut or even badly scored hides are an exceptional occurrence.

The inspection of beef intended for export is very thorough indeed, no portion of the meat goes into the cool chamber without having been scrutinised, whilst all important glands are exposed and cut open, and all portions of the animal specially liable to carry any of the serious diseases are subjected to particular attention by trained Veterinary Surgeons.

In Argentina the frigorificos are very extensive industrial concerns, and the larger of them are almost self-contained, purchasing practically nothing but raw materials, and to do this they must maintain their own cooperage for barrels for fat, box-making plant, can-making, solidifying oil, soap-making, stockingette mills for carcass covers, label-printing, and, indeed, everything required. Near the large towns the frigorificos maintain cafeterias for their employees, and also sell them meat at reduced prices, whilst out in the country the meat works generally control all activities of the whole village which builds up around the works, including housing, water supply, milk, stores, &c.

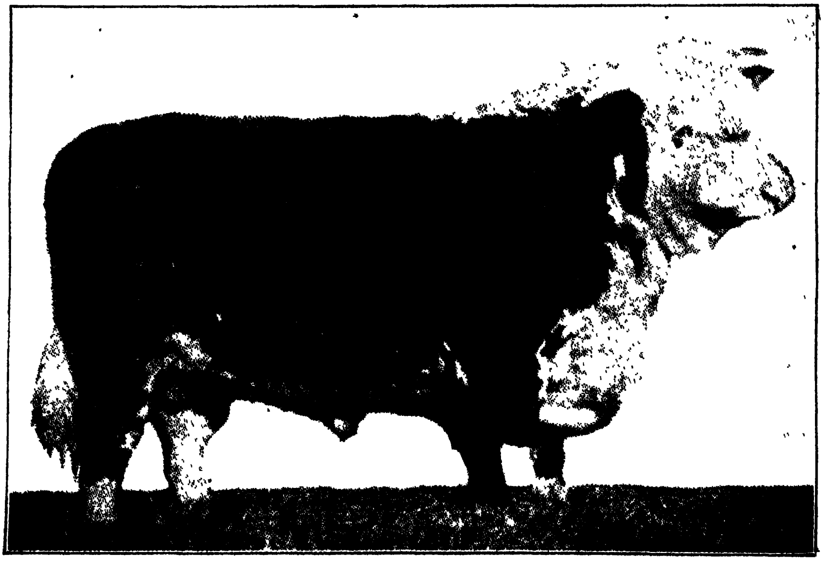
Export of Beef from Argentina.

Before the growing of crops was seriously undertaken in Argentina the production of cattle for export was her principal industry. In earlier days cattle were maintained to produce hides and fat for export, but when the frozen beef trade was opened up the cattle-rearing business took on a different aspect, and meat became the most valuable part of the carcass. From the very commencement of this new era the Argentine breeder started to improve his cattle from a beef-producing point of view, and succeeded so well that the country quickly established



[From *Buenos Aires Herald.*

Champion Hereford Bull at the Palermo (Buenos Aires) Cattle Show in 1875. As is the case with Shorthorns, typical animals of 60 years ago were very poor when compared to present-day Herefords.



[From *Buenos Aires Herald.*

A Prominent Prize-Winning Hereford Bull at the Palermo (Buenos Aires) Cattle Show in 1934. Other than in colours and markings, there is no similarity between the Herefords of 60 years ago and those of to-day, as can be seen by comparing the picture of this bull with the illustration immediately preceding.

a very extensive export trade in beef, and as the Argentines are big meat-eaters the number of animals required for slaughter for export and home consumption is quite considerable. The following table shows the slaughterings of cattle of recent years, but does not include those slaughtered on farms, which are estimated to be about 1,000,000 head annually.

*Cattle Slaughtered for Export and Home Consumption.**

Year.	Home Consumption.	Export.	
	Head.	Head.	Per Cent.
1912-14 (average)	1,882,000	1,369,000	42.1
1924	4,115,000	3,497,000	45.9
1925	4,222,000	3,153,000	42.8
1926	3,980,000	2,818,000	41.5
1927	3,781,000	2,996,000	44.2
1928	3,808,000	2,459,000	39.2
1929	3,837,000	2,300,000	37.5
1930	3,828,000	2,138,000	35.8
1931	3,604,000	1,779,000	33.0
1932	3,653,000	1,691,000	31.6
1933	3,985,000	1,718,000	30.1

* "Boletin Mensual de Estadistica Agropecuaria."

These figures hardly give a true picture of the position because in the numbers are included stock under one year of age, of which a lot are slaughtered, but mostly for home consumption. For instance, in 1925, of these youngsters 1,001,000 were slaughtered, and 916,000 of them were consumed locally, and in 1932, although 635,000 were slaughtered, only 9,000 were exported. The next table, showing as it does the tons of beef exported, gives a better idea of how important this export trade is to Argentina.

*Exports of Beef from Argentina.**

Year.	Frozen Beef.	Chilled Beef.	Jerked Beef.	Total Frozen, Chilled, and Jerked.	Preserved Meat (Mainly Beef).
	Tons.	Tons.	Tons.	Tons.	Tons.
1914	323,026	40,038	2,339	365,403	12,878
1924	362,479	358,376	15,317	736,172	80,135
1925	291,889	366,513	13,479	671,881	66,303
1926	223,111	423,836	9,322	656,269	60,152
1927	232,637	459,202	8,159	699,998	60,520
1928	122,690	376,948	4,780	504,418	65,767
1929	119,763	352,233	338	472,334	67,967
1930	97,168	339,997	153	437,318	61,421
1931	82,342	346,591	25	428,958	54,197
1932	36,073	364,704	4	400,781	43,568
1933	30,944	344,445	—	375,389	54,117
1934†	31,086	344,120	—	375,206	60,090

The United Kingdom in recent years has taken about 90 per cent. of the Argentine exports of chilled and frozen beef; in 1932, the proportion rose to 96 per cent.

* "Cattle and Beef Survey" of Imperial Economic Committee, June, 1934.

† "Boletin Mensual de Estadistica Agropecuaria", January, 1935.

NOTE.—In translating the figures into English a tonelada was taken as 0.9842 ton.

Not only is the quantity of beef exported from Argentina really considerable, but the quality of the chilled beef is of the very highest. As a producer of baby beef Argentina stands alone, for she has a very large area of country with natural conditions which enable her to produce annually hundreds of thousands of steers in the primest of condition weighing 1,100lbs. and more by the time they are two years old. Kept on their mothers in Lucerne fields until they are nearly a year old, weaned on Rye or Oat crops, transferred to Lucerne fields, and fattened on Sorghum and Lucerne, they make ideal chillers, and the very best of baby beef. In these ideal beef-raising conditions the fattening steers, from the time they are weaned until they are ready for slaughter for export, will increase in weight consistently at the rate of about 45lbs. per month. Not only have they the necessary weight, but they are of the highest quality, being in most cases pure-bred Shorthorns, and more often than not their sire's sire was a high-priced bull imported from Great Britain.

SHEEP IN ARGENTINA.

Besides being very prominent as a breeder of cattle Argentina is also an important sheep-producing country, and at the last census of livestock taken in 1930 was maintaining 44,413,221 sheep. Although in a general way sheep require different natural conditions to those necessary for cattle, at present the Province of Buenos Aires is easily the most important part of the country for sheep as it is for cattle, and the Provinces of Entre Rios, Corrientes, and Córdoba carry a fairly high proportion of both kinds of livestock. On the other hand the Province of Santa Fé and the Territory of the Chaco which support a lot of cattle have relatively few sheep, whilst the Territories of Santa Cruz, Chubut, La Pampa, and Rio Negro are very important sheep-producing districts, but do not maintain many cattle. The principal sheep-raising parts of the country are:—

Province of Buenos Aires	14,086,741
Territory of Santa Cruz	6,880,392
Territory of Chubut	5,004,173
Province of Entre Rios	3,396,295
Province of Corrientes	3,298,657
Territory of Rio Negro	2,315,985
Territory of La Pampa	2,253,070
Province of Córdoba	1,109,783
Province of Santiago del Estero	1,108,714
Other Districts	4,959,411
Total for Argentina	44,413,221

Although sheep were brought into the country a little before cattle were introduced, the same amount of interest was not taken in the smaller animals, which in the early days of settlement appeared to be due to the fact that there was no ready sale for wool, and the people did not like mutton as much as beef as a foodstuff. As a matter of fact, to the present day, it is commonly stated throughout Argentina that beef is the only meat that can be eaten year in and year out, in much the same way as Australians say it of mutton. The first sheep brought to South America by the Spaniards were of the breed known as Churra, and some of these were brought from Peru to Paraguay (then a part of the River Plate) in 1549, a further consignment was taken to Tucuman in the following year, and other introductions are recorded for 1553 to Santiago de Estero, 1558 to Catamarca, 1561 to Mendoza, and 1580 to Buenos Aires. By the end of the 18th century the Churra sheep had become separated into two types, called respectively the Pampas and the Criollas. These sheep have been described as being somewhat similar to Angora goats, the rams having straight horns, and the animals growing long, straight and glossy wool. In the early days of the 19th century Mr. John Marriott, an Argentine stockbreeder, wrote that "the Pampa sheep constituted a breed very distinct from the Criollas. Larger with much more frame, longer legs on which, as well as on the head, they generally had red or black marks; long thin head, with great abundance of wool, nearly always wavy, they were incomparably superior to the Criollas as a foundation for breeding Merinos."

In 1794 the first consignment of Merinos, consisting of 20 ewes and 10 rams, was received in the country, and the animals were placed in Uruguay, but they appear to have disappeared entirely. There was sent from Spain in 1804 a group of 24 sheep of the best blood, but no records have been left of the breed of these animals, nor of their ultimate fate. The first flock of Merinos established in the country was in 1818, when the American Consul in Buenos Aires, Mr. Thomas Lloyd Halsey, got together a flock of this breed, and this was the starting point of the improvement of the sheep of this part of South America. Messrs. Thomas and Robert Gibson started several flocks of sheep in 1835, with Pampa ewes, and mated these to Merino rams. The importations of Merino sheep reached 4,200 in the period 1836-1838, and in 1842 the Gibsons introduced seven ewes and four rams of the Saxon breed, and a few years later brought in Cotswold, Cheviot, Leicester, Lincoln, and Romney Marsh, of which assortment they found Lincoln to give the best results.

[From *Almanaque del Ministerio de Agricultura*, 1935.

Champion Argentinian Merino Ram at the Palermo (Buenos Aires) Agricultural Show in 1934

The two breeds of sheep which showed so much promise in the early part of the 19th century—Lincoln and Merino—continued in favour, and at the last census in 1930 constituted about 65 per cent. of the whole flocks of Argentina, and the only other breeds making progress, all of which has been made in recent years, are Romney Marsh and Corriedale. The 1930 census showed the following numbers of the various breeds of sheep:—

Lincoln		14,504,005
Merino—		
Argentina	13,191,306	
Australian	1,132,607	
		14,323,913
Romney Marsh		7,556,531
Corriedale		3,397,469
Hampshire		368,382
Oxford		24,667
Shropshire		10,852
Karakul		1,419
Not Specified		4,225,983
Total		44,413,221

Judged by the sheep seen in sale yards and at frigorificos this classification must include everything that has the least resemblance to a particular breed, because the percentage of nondescript animals sent in for slaughter appears to be a good deal higher than the figures quoted.

Merino Sheep in Argentina.

Merino sheep were introduced into Argentina shortly after the first lot reached Australia, but the breed did not make anything like the same progress in the two countries. In Argentina so much attention has been given by breeders of livestock to the production of beef and the improvement of beef cattle that sheep have been more or less neglected. This specialising in cattle-raising activities which has put Argentina in front of the world as a producer of the highest-quality beef, certainly contributed to the lack of development of the sheep industry, but the slow progress being made with the Merino breed seems to be due more to the unsuitability of the natural conditions of most of the country than to anything else. Natural conditions almost ideal for the raising of cattle are hardly likely to favour Merinos, because they require Mediterranean climate, undulating or even hilly land, dry underfoot conditions, and a dry period of the year, and do not thrive to full advantage on extremely fertile, level-plain land, rank luxuriant growth, and evergreen pastures which are liable to be wet for extended periods. North of Argentina's low-rainfall belt is really good cattle country, and west and south of this dry zone, where the climatic conditions would be fairly favourable for the Merino, the area of country receiving more than 8in. of average annual rainfall is relatively so small that the number of Merinos carried can never be very large. The position might be altered to some extent if a constant and ready supply of high-class Merino rams was always available to keep up the virility of the flocks, as is necessary in portions of Australia where Merinos are maintained, but failing this aid it does not appear that Argentina will become a really important Merino-sheep country.

[From *Almanaque del Ministerio de Agricultura*, 1935.

Champion Australian Merino Ram at the Palermo (Buenos Aires) Agricultural Show in 1934. In Argentina, Merino Sheep are classed as Argentine Merinos and Australian Merinos, and separate prizes are provided for each type at the principal agricultural shows.

Sheep for Mutton.

The position as regards the production of sheep for meat is quite different than the production of large quantities of fine-quality wool, for some of the mutton breeds of sheep can withstand rank, damp pastures fairly well, particularly if they are reared in hilly country and are only brought on to the rich plains for their last couple of lambs, and some of the poor-woolled breeds and hairy breeds retain their vigour in fairly tropical conditions. Until meat-exporting restrictions were put on Argentina, she was making progress in the export of mutton and lamb carcasses, and can rapidly expand in this business should a favourable opportunity offer.

* *Slaughter and Export of Sheep and Lambs in Argentina.*

Year.	Number Slaughtered.	Total Exported.	
		Frozen.	Chilled.
	No.	Tons.	Tons.
1928	5,914,486	73,388	—
1929	6,556,709	79,275	—
1930	7,349,207	79,093	237
1931	6,860,023	81,731	460
1932	6,767,051	69,515	348
1933†	7,028,044	61,173	475
1934†	—	47,726	165

* Cartilla Argentina.
† "Boletin Mensual de Estadistica Agropecuaria."
NOTE.—In translating the figures into English a tonelada was taken as 0.9842 ton.

The relative importance of sheep and lambs to Argentina from an export point of view is shown in the next table, where the numbers of carcasses sent overseas during the past three seasons are shown:—

**Sheep and Lamb Carcasses Exported from Argentina.*

Year.	Lamb Carcasses.	Sheep Carcasses.
	No.	No.
1932	3,551,445	834,373
1933	3,507,957	593,031
1934	3,034,314	472,426

* "Boletin Mensual de Estadistica Agropecuaria."

Besides the carcasses of mutton and lamb exported, the quantity of wool and sheepskins sent overseas reaches considerable dimensions, as can be seen in the following table:—

* *Wool and Sheepskins Exported from Argentina.*

Year.	Wool.			Sheepskins.
	Greasy.	Scoured.	From Frigorificos.	
	Tons.	Tons.	Tons.	Tons.
1928............................	115,772	2,448	5,201	20,482
1929............................	118,303	2,622	6,002	19,831
1930............................	124,418	2,481	5,978	20,450
1931............................	127,787	2,726	7,993	21,272
1932............................	110,290	4,447	5,674	19,931
1933†............................	142,145	7,583	6,495	25,782
1933†............................	96.021	7,865	5,389	16,870

* Cartilla Argentina.
† Boletin Mensual de Estadistica Agropecuaria.
NOTE.—In translating the figures into English a tonelada was taken as 0.9842 ton.

Slaughtering Sheep.

In all frigorificos slaughtering sheep for export the chain system is in force for the dressing of the carcasses. Some utilise the large revolving circular discs for transferring the animals from the catching pens to the knifing point. A clip is attached to one hind leg of a lamb or sheep and this is hooked on to the circumference of a large circular disc which is slowly revolving against one end of the pen holding the animals to be killed, with the result that the animal is carried up and forwards right out of the pen, and as it is hanging head downwards, reaches the killer in a convenient position to be knifed. From the disc it is picked up on the slowly travelling chain and passes along the line of butchers to be dressed for market. The operations in dressing the carcasses are very similar in all places where the chain system is in use, as in New Zealand, where it is general, and in some parts of Australia. Whatever advantages the chain system of dressing sheep has over the individual method as regards speed of dressing, lesser damage to skins, and the utilisation of relatively unskilled labour, probably the greatest advantage of this system, where export carcasses are concerned, is that the carcasses are not marked during disembowelling with irremovable stains due to being handled by men who have been displacing skins carrying dirty wool. Further, because the disembowelling is done at a central point, the inspection of the internal organs so very essential where export carcasses are concerned is facilitated to a very great degree, and leads to the more ready detection of disease.

Sheep Sale Yards of Buenos Aires. It was found necessary to remove the sheep sale yards of Buenos Aires to another site a few years ago, and when this was done protection was provided for human beings by tiled roofs over all roadways, and a tree was planted in every sheep pen to ensure shade for the animals.

At the frigorificos where sheep are killed for export the same close inspection as is given to beef is carried out, all important glands being exposed and cut.

Buenos Aires Sheep Saleyards.

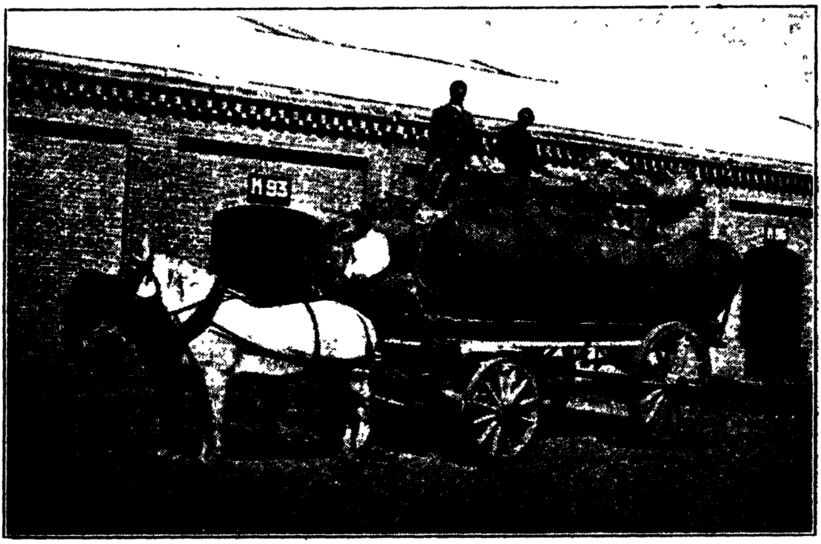
Fairly recently new saleyards for sheep were erected on a fresh site on the outskirts of Buenos Aires, and they form a convenient and satisfactory set of yards for the handling of large numbers of sheep. The drafting yards are on the outside of the main yards and convenient to the railway sidings. The yards and roadways are well graded and nicely paved, and every open-way between the yards is covered by a tiled roof running its full length. All yards throughout the whole area are shaded in summer by deciduous trees, which are now just old enough to be useful for the purpose for which they were planted, but they will become increasingly valuable as they get larger. Several large weighbridges are provided at convenient spots in the saleyards to facilitate the weighing of the animals, all of which are sold by liveweight. Dogs are not allowed in the saleyards, nor are whips employed; but the movements of sheep into the yards or from pen to pen is helped by decoy sheep led by youths on pieces of rope, and by drivers with bells and rattles.

Selling Wool in Argentina.

Wool is sold in a very different manner in Argentina than is usual in Australia and New Zealand, although this year an attempt was made to introduce the sale by public auction with catalogue at Buenos Aires, but without much success. At one sale only about 15 people attended, and almost every line offered was passed without a bid, and the few lines in which buyers were interested were knocked down without competition.

Wool Exhibited for Sale in Argentina. On arrival at a wool store the wool is tipped on to the floor, all black wool is removed, and the remainder is then tidily stacked. Wool buyers negotiate with sellers as to price, and when a purchase has been completed the wool is re-parcelled and carted to the wool-sorting and wool-baling store of the buyer.

Most wool which is classed on the estancias is sent to England for sale, but the remainder which is not classed in any way is sent by growers to the wool stores in packages of all kinds, from bag size to bales, the covering in most cases being hessian, and frequently the consignments were poorly protected. More often than not the wool is just bundled into the packages, but in some cases the fleeces are rolled before sending to market. The woolbroker receives the consignment and removes it from the original packages and stacks the wool on the floor of his selling warehouse, as a rule removing beforehand black wool and badly stained pieces, and if instructed removes extreme types. Some of the stacks reach dimensions of 25ft. x 12ft. x 7ft. in height, and although all sorts of wool are to be found in the stacks, a nice tidy job is generally made of the stacks, and most of them have slightly sloping sides and ends, so that the top area is a bit smaller than the bottom. The wool is sold privately, the wool stores being open every morning for buyers and every afternoon for receiving and stacking consignments. A representative of the woolbroker is in attendance at all times to receive and sell wool. When wool is purchased it is reparcelled and carted to the Barraca (wool-classing and baling store) of the buyer, where it is carefully classed, and that required for shipment is baled, whilst the unsuitable types are sold at the Barraca. The woolbuyers do their purchasing in the mornings and classing in the afternoons. Sheepskins and hides are sold in the same stores and in a similar manner. This method of selling wool is hardly likely to favour the producer, but must be of considerable advantage to the buying firm, because an expert of this firm classes the wool to suit its requirements, and a lot of unsuitable wool is not shipped to the firm's manufacturing premises.



Carting Wool from the Wool Store to Barraca, i.e., Wool-sorting and Wool-baling Store. On arrival at Barraca the wool is classed, and that portion required by the buyer is baled and forwarded to his principals in England, Germany, France, &c., while the unwanted remainder is again sold in Argentina.

Most of the long-woolled sheep, whether pure-bred or crossbred, are shorn twice a year, the one clip being of about seven months' growth and known as three-quarter wool, and the other of about five months and known as half-wool. These types appear to suit important European interests better than allowing the full 12 months' growth.

PIGS IN ARGENTINA.

Pigs have rapidly become important in Argentina as livestock producing meat for export, and would have been still more prominent than they are if it had not been for the meat quota restrictions of Great Britain. As it is, the census of 1930 disclosed 3,768,738 pigs, the most of which, as with other forms of farm livestock, were found in the best agricultural districts of the country, as follows:—

Province of Buenos Aires	1,838,494
Province of Santa Fé	542,940
Province of Córdoba	513,528
Territory of La Pampa	114,553
Province of Santiago del Estero	109,762
Other Districts	649,461
Total for Argentina	3,768,738

That pigs have rapidly become important from an export point of view is to be seen in the following table, where total slaughterings and the export of pig-meat are shown for recent years:—

**Export of Pig Products from Argentina.*

Year.	Total Slaughtered.	Exports.		
		Frozen Pork.	Hams.	Bacon.
	No.	Tons.	Tons.	Tons.
1928..........................	815,050	3,797	26	77
1929..........................	933,649	4,809	35	25
1930..........................	910,151	4,754	19	14
1931..........................	933,466	5,195	77	39
1932..........................	1,003,175	6,415	1,838	784
1933†........................	1,242,385	9,097	2,622	578
1934†........................	—	14,825	2,262	295

* Cartilla Argentina.

† Boletin Mensual de Estadistica Agropecuaria.

NOTE.—In translating the figures into English a tonelada was taken as 0.9842 ton.

The above table does not show the full value of the pig to Argentina from an export point of view, as for instance in 1934 there were also exported 2,939 tons of pig-product manufactures valued at about one-quarter of the value of the frozen pork, 2,820 tons of lard worth about one-tenth of the frozen pork, 2,563 tons of pickled pork worth about one-seventh of the value of the frozen pork, and a little chilled pork and a few tons of pig skins.

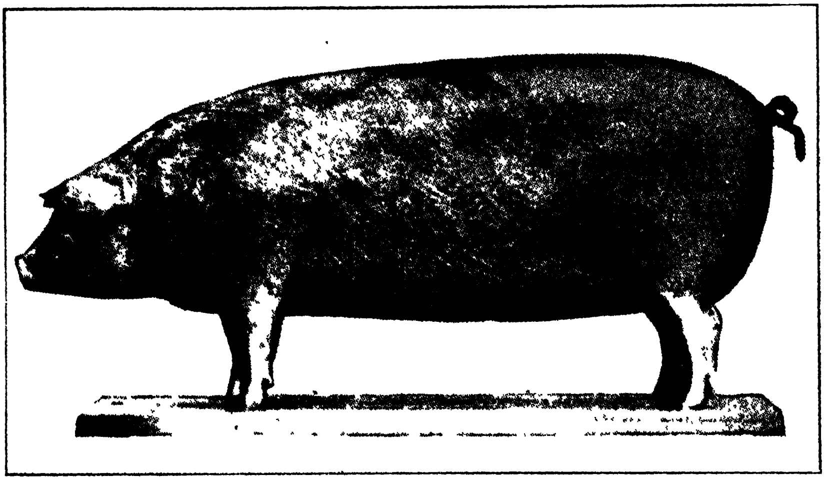
In connection with the use of pork as a foodstuff an interesting case of the development of a people's taste has occurred in Argentina. Of recent years large numbers of Italians have migrated to the country, and the frigorificos commenced making "Salami" for these immigrants. "Salami" consists very largely of sausage meat of pork and pig fat, and is highly seasoned with garlic, put in casings of various sizes, tightly bound round and round with cord, and instead of being cooked is stored in rooms kept at a regular temperature and regular moisture-content, and is matured in a manner somewhat similar to some cheeses, *i.e.*, by the development of a strong-growing mould on the outside of these huge sausages. The frigorificos started by making small quantities at the demand of the Italians, but the local people have taken so kindly to this foodstuff that all manufacturers are so pushed for space to mature it that they can hardly keep abreast of the demand, and hundreds and hundreds of tons are now being consumed annually.

It is impossible to estimate what proportions the export of pig products would have reached but for the meat quota, for when the restrictions were put on, many of the principal pig-breeders of the country, the members of the Pig-breeders' Association of Argentina, voluntarily reduced their herds, in some cases disposing of half of their breeding animals.

The Breeds of Pigs.

All of the well-known breeds of pigs are represented in Argentina, but the Duroc Jersey predominates, with the Berkshire prominent, Middle White in the cooler districts, and about half a million Poland China pigs.

No matter what the breed of pigs being kept by anyone in Argentina every effort is being made to bring it to a type suitable for present-day requirements, and the progress made in this direction is really remarkable, and is wholly due to the fact that a very strong Pig-breeders' Association exists in the country. This organisation, with one of the world's greatest pig experts at its head as President (Sr. Juan C. Campion), is sufficiently strong to control the pig industry of Argentina, and as soon as it was realised that a change had come in the type of pig carcass required by the only important market in the world, that of Great Britain, this Association got to work to meet the market. The change needed was very great, because the two principal breeds in the country—Duroc Jersey and Berkshire—were of a type almost directly opposite to that required, but the Association tackled the problem in a simple and very practical manner. A committee of thoroughly experienced pig-raisers was formed, and from charts showing the market value of the various cuts of the carcass, built up a theoretically ideal pig for present-day requirements. An artist was then engaged to sketch this pig, and from the diagrams a model of a pig about 2ft. in length was made of silver by a London firm of jewellers. This model is taken as the standard of type for all pure-bred pigs in Argentina, no matter what the breed, and at the principal agricultural shows this model is put before the pig judges before they commence inspecting the exhibits. To ensure that the ideal is not lost sight of, the trophy for the principal awards at Pig Shows consists of a silver replica of the standard model, about 6in. in length. All breed societies did not fall in immediately with the Association's arrangements, but even the Berkshire Pig Society has now come into line and is making great efforts to catch up leeway.



Silver Model of the Theoretically Ideal Pig for Present-day Requirements. This model is taken as the standard of type for all pure-bred pigs in Argentina, no matter what the breed. Constant reference to this model by judges has resulted in a complete change from the over-fat type of a few years ago to the relatively lean, long, deep, fine-shouldered pig desired by the British market

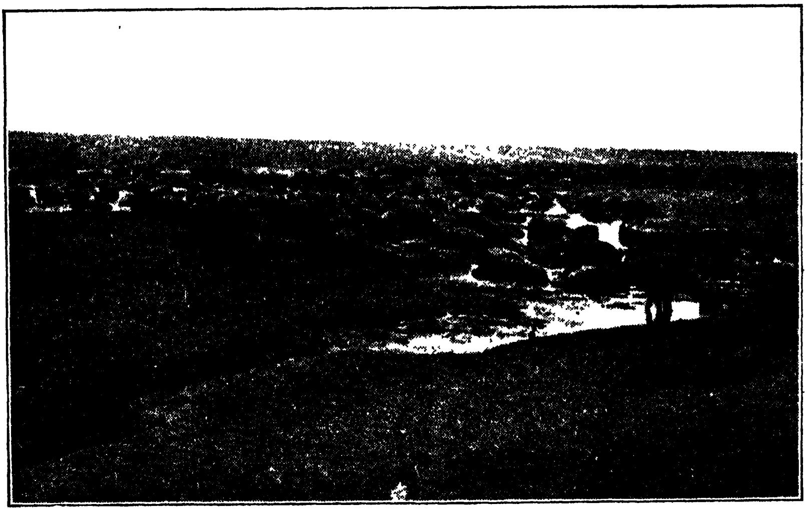
The Duroc Jersey of Argentina has been described as a Large White with red hair, but that is hardly a correct definition, for the breed characteristics are quite distinct, but they have been so altered from the old type that they are now of a build almost ideal for the British market. They are long, fairly high animals, with fine bone and shoulders, deep sides, with fair hams and strongly roach-backed, and having retained their noted hardiness and resistance to disease are almost ideal for the method of handling pigs as practised in Argentina.

Even though Berkshire breeders would not go so far towards changing type as the breeders of other kinds, they were making the change gradually, and large numbers of Berkshires were seen of the new American type which has become known as the Canadian Berkshire in New Zealand and Australia.

Poland China pigs, which are not popular in Australia, have also been fully transformed in Argentina and now fulfil market requirements as the old type of this breed never could.

Managing Pigs on a Large Scale.

The principal breeders of pigs in Argentina are located in the Maize belt and raise pigs by thousands in the open without fixed sties, and for the purpose the Duroc Jersey breed is admirably fitted. At one place visited—"Santa Juana," one of the estancias of His Excellency the Minister of Agriculture, the Hon. Luis Duhau—2,500 Duroc Jersey sows of fine-boned, fine-haired type are maintained, and 18,000 to 20,000 pigs, weighing 220lbs. live-weight, are sold each year. The farrowing fields are about 24 acres in extent, and are always located where there is a good stand of Lucerne. In each field 30 sows, which are to farrow as nearly as possible on the same day, are placed. A simple shelter is supplied for each sow, consisting of a galvanized iron sheet 10ft. long by 4ft. wide, one end of which is pushed a few inches into the ground and the other carries a hinged frame which supports that end about 2ft. 6in. above ground level. The three open sides are surrounded by a heavy wooden frame about 10in. in height. The sow farrows under the shelter, and although the wooden frame does not interfere with the movements of the sow it is high enough to prevent the youngsters leaving the shelters until they have grown somewhat. A large mud pool is maintained in each farrowing field by keeping the windmill working most of the time when there is sufficient wind for the purpose. The Lucerne fields are so managed that young sappy growth of Lucerne is available during the spring farrowing period, and for

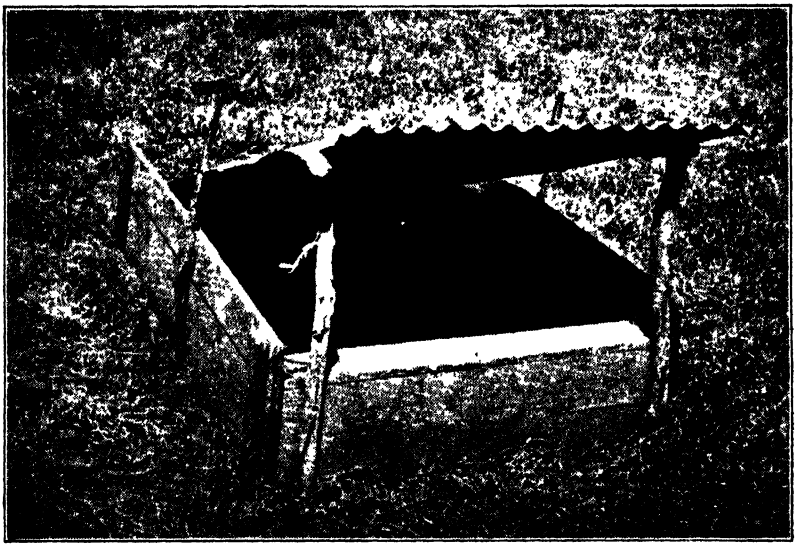


Extensive Mud Bath for Pigs, as commonly seen in Argentina. An essential feature of the rearing of pigs in the open in Argentina is the provision of mud baths, in which the pigs can wallow at will. The water is maintained in most of the mud baths by allowing windmills to pump water from wells the whole time, the water being allowed to run straight on the ground.

the autumn farrowing Barley is drilled into the Lucerne fields. The young pigs are weaned on to good green feed and are fed maize as well, but when preparing them for market mobs of 1,000 to 3,000 slips are turned into crops of standing Maize to harvest their own grain, having the run of a Lucerne field at the same time. Wherever the pigs might be, mud pools are always available in which the animals can wallow when they desire.

At "El Trio," belonging to the President of the Pig-breeders' Association of Argentina, Sr. Juan C. Campion, 2,000 breeding sows of the Duroc Jersey breed, and essentially of good modern type, are kept for the production of market pigs. At farrowing time the sows are separated into lots of 20 to a field of Lucerne, in which are provided 20 shelters consisting of three sheets of 6ft. corrugated iron joined together lengthways with bolts, and with channel iron closed on both top and bottom. This 6ft. by 6ft. sheet is maintained at an angle of about 30 degrees to the ground by letting one end into the ground a few inches and supporting the other end on a peg driven into the soil, to which it is wired. No attempt is made to keep the pigs of each sow separate, but the youngsters of the whole 20 sows mix together as soon as they are able to walk about. In cool weather the iron is left bare, but when hot the sheet is covered about 6in. deep with old Lucerne hay. In summer the open side of the shelter is faced away from the sun, but in autumn and spring is turned around to allow the sun to shine on the sow. In winter, for fattening pigs and for sows without young, different shelters are used, consisting of light iron frames about 8ft. to 14ft. in length and 8ft. wide, covered with galvanized iron. These shelters are more or less wedge-shaped, the back being about 10in. high and the front about 4ft. The ends are closed in except for the bottom 9in., over which hinged flaps are dropped in cold weather, but they are opened up to admit of a flow of air should the weather become hot. These shelters are built to slide like sledges, and provision is made to hitch one end to a waggon to change position in the field.

Type of Pig Shelter used for Farrowing Sows on "El Trio." This shelter consists of three 6ft. sheets of galvanized iron rivetted together and held in position on a peg driven into the ground, a few inches. For coolness in hot weather the shelter is covered with lucerne hay or some such material.



Type of Pig Shelter used for Farrowing Sows on "Santa Juana." Two 10ft sheets of galvanised iron are rivetted together and held in position by a frame-work hinged to one end. The three open sides are surrounded by a heavy wooden frame, about 10in in height, which does not hinder the movements of the sow, but prevents the youngsters leaving the shelters until some days old.

Winter Shelter for Fattening Pigs and Sows without Young, as used on "El Trio" Built to slide like sledges, one end is hitched to a wagon to change position in a field, which is done frequently

A creep-pen with several ingenious features is provided in each farrowing field, and half-in and half-out at one end is attached a water tank and trough to supply both sows and youngsters with clean drinking water. The floor of the pen is covered with sheet iron, and so is readily cleaned, and as the pen is built to slide, it is easily shifted to fresh sites in the field. As these creep-pens are really heavy, particularly when the water tank is full, the feed waggon is fitted with ratchet winch to lift front of pen from the ground before dragging it forward when the waggon team moves on.

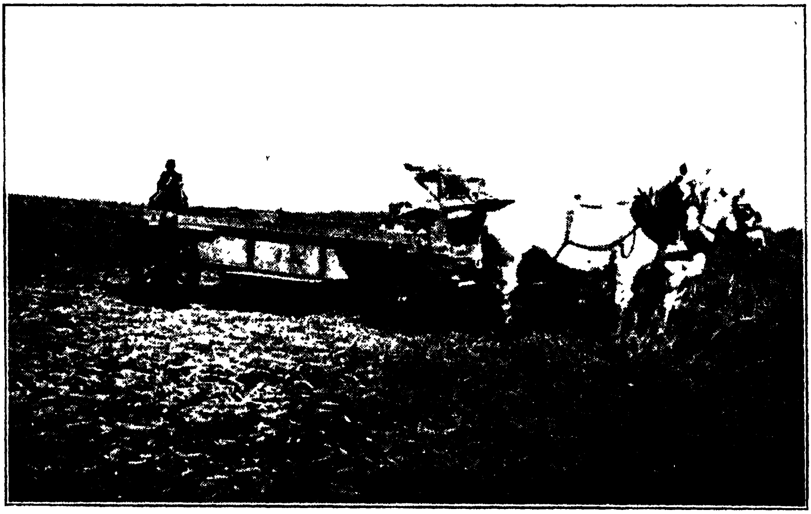
The sows with young receive about 2lbs. of cob maize per day, and soaked maize grain is fed in the creep-pens every day, the quantity varying with the size of the young pigs.

The breeding pigs are managed as units of 500 sows, which are looked after by a foreman, a feeder, and a water-carter, with extra help at farrowing time. Feed and water are taken to the fields every day. The feed waggon is actually a portable grain-soaking tank, and once a day sufficient grain for a day's feed is put in the tank, water added, and allowed to soak for 15 hours. The grain is all removed each day, after which the tank is cleaned and a fresh lot put to soak. A platform between the tank and the driver's seat of the waggon is used to carry bags of cob maize to feed to the sows. The creep-pens, shelters, feed waggons, and water-carts are standardised for all units.

A Creep Pen for Young Pigs used in the Farrowing Fields of "El Trio," which admits of the youngsters getting extra food away from their mothers. The water trough for young and old pigs is affixed to the creep pen. Provision is made to hitch the creep pen to the back of the feed wagon for moving it to fresh sites.

When preparing pigs for market the animals have the run of a lucerne field and standing corn in autumn and early winter, but later in the season are developed on growing rye and have maize carted out to them.

A portable dip with a lot of unique features is used at "El Trio." The dip—a tank on four wheels—is waggon-like in appearance. Surrounding the top of the tank are pig-proof fences, so that it becomes a yard, and at each corner is a pulley-block and tackle used to lift and lower a false bottom of the tank. When the false bottom is raised to the top of the tank an ordinary-looking pig-yard is the result, and according to size 10 to 40 pigs are driven into the yard, up a ramp from the ground. The entrance gate is closed, and the false bottom with its load of pigs is lowered to the bottom of the tank of dipping liquid. The ramp up which the pigs travel to reach the tank is mounted on a pair of wheels, is always behind the waggon-dip, and because of the simple and ingenious connecting loop, runs more or less parallel to the ground while travelling along, but when required for use slips up and forward towards the dip, and the back end comes to the ground. When the catch which keeps the ramp up against the dip is undone, and the horses move forward, the ramp again takes up a horizontal position.



Feed Wagon used to take Foodstuffs to the Pigs in the Farrowing Fields of "El Trio." Really a portable grain-soaking tank, soaked grain is taken daily by it to the young pigs, and bags of cob maize for the sows are stacked on the platform provided for the purpose. A hand winch is fitted to the back of the wagon for lifting one end of a creep pen when about to move it to another position in the field

Portable Pig Dip in Use on "El Trio." When the false bottom is raised by the pulley blocks on the corners to the top of the tank an ordinary-looking pig-yard is formed. When the yard is filled with pigs the false bottom is lowered into the tank of dipping liquid, and all pigs are immersed

Particular care and attention is paid to the large stud of pigs maintained at "El Trio," and most of the rapid success attained in changing the type of Duroc Jerseys to meet present-day requirements is due to the fact that the final selection of stud animals is made at six months of age, *i.e.*, the age at which pigs are of a marketable size. Whether an animal stays in the stud or not depends upon the proportion of stud animals amongst its offspring, as shown by the book records, and whether the animal has improved or deteriorated in looks, as it grows older, does not affect the position at all. Sows farrow twice a year, and every effort is made to have them farrowing within a few days of each other in autumn and spring. Twice a year, when these pigs are six months of age, Senor Campion personally classifies them, and discards 50 per cent. from the stud, and the remaining 50 per cent. is divided into 5 per cent. of first grade, 10 per cent. of second grade, 15 per cent. of third grade, and 20 per cent. of fourth grade, and as they are all ear-marked, it is easy to record them in the books according to their breeding. On the number of high-class progeny recorded depends the length of time a sow or a boar is kept in the stud. With proper book records there is no need for the breeder to look at the stud animals more than at the time of selection, when utility rather than show animals are desired. Senor Campion goes so far as to consider that because most pigs are sold at six months of age, all show animals of all breeds of pigs should be judged at six months of age, and if older pigs are admitted to shows they should be for exhibition only.

Ramp Used on Portable Dip when Dipping Pigs on "El Trio." The ramp is always attached to the back of the portable pig dip, and because of a simple and ingenious connecting loop runs in a horizontal position when travelling along, but when required for use slips up and forwards towards the dip, and the back end comes to the ground.

It is generally recognised in Argentina that it is impossible to tell for a certainty from an inspection of a live pig how the animal will kill out, and so every year the block test is carried out on the pigs entered in export classes.

Spectacular Pigraising.

There is no doubt that this Argentine method of raising pigs by thousands and rearing them wholly in the open like grazing animals is very spectacular and rather impressive, but it is doubtful if it is a more economic method than that practised in other countries. When carried out by expert pig-raisers evenness of type is properly maintained, but the advantage gained by considerably lowered labour costs are probably lost in the very small numbers per litter that reach the marketable age, and the terrific losses that occur when disease breaks out. Running a few hundreds of pigs as a part of farming activities, where they are kept to use up a farm by-product, such as skim milk, poor grain, &c., keeping them in the open, and supplying the dry feed in self-feeders, probably results in the production of pork at as low a figure as in Argentina, with more chance of keeping an even type and less risk of very heavy losses.

The possibilities of extending pig-production in Argentina is almost unlimited, because Lucerne, Maize, and Wheat are grown so easily on large areas of country, and it is only the lack of markets for pig products that sets a limitation.

[From *Buenos Aires Herald*.

A Large Consignment of Pure-bred Pigs of one age, Reared on one holding, and Sold at the one time 2,308 Duroc Jersey Pigs, averaging 249lbs. in weight, bred and reared by Coquet Bros., Laplacette, Argentina, and sold to Swift and Company, of La Plata, Buenos Aires, Argentina.

DAIRYING IN ARGENTINA.

Although Argentinians have become so very expert in the production of beef cattle, they have not paid so much attention to dairy cattle, and so progress in this industry has not been nearly so great as with other forms of livestock; nevertheless, the production is fairly considerable, and can be increased to an almost unbelievable extent. Of recent years the production, export, and local consumption has been somewhat as follows:—

* *Dairy Products in Argentina.*

Year.	Butter.			Cheese.			Casein.		
	Produced.	Exported.	Consumed.	Produced.	Exported.	Consumed.	Produced.	Exported.	Consumed.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1928 ..	29,914	19,724	10,231	16,338	341	17,933	17.490	17,316	Estimated 246 tons per year.
1929 ..	27,391	16,762	10,662	15,202	355	16,631	16,530	16,346	
1930 ..	32,975	22,837	10,184	15,024	332	16,376	16,127	13,517	
1931 ..	35,785	22,842	13,088	14,521	471	14,927	14,283	13,769	
1932† .	36,221	24,914	10,613	18,301	655	15,419	19,283	17,367	
1933‡ .	32,077	13,689	—	22,883	926	—	21,298	22,674	- -
1934‡ .	—	8,191	—	—	1,473	—	- -	20,011	- -

* Cartilla Argentina.

† Boletin del Ministerio de Agricultura.

‡ Boletin Mensual de Estadistica Agropecuaria.

Note.—In translating the table into English the figures used were:—Tonelada = 0.9842 ton and kilo = 2.2lbs.

The principal points brought out by the above figures are that Argentina is only a fairly important dairying country at present, that her export of butter has dropped considerably and rapidly, that although still an importer of cheese she is progressing with its production and export, and that casein is a highly important dairy product in the country.

Production of Milk.

The vast majority of the cows producing milk for sale are of the Friesian breed, relatively few cows of any other breed being in evidence. Although quite a lot of these milch cows are really first class Friesians, high milk returns are hardly ever heard of, but this is largely due to the fact that it is a common practice of dairymen to allow the cow to suckle her calf until it reaches some months of age. This leads to the production of high grade vealers and well-developed heifers, but milk yields are lowered enormously.

A large proportion of the dairy farms appear to contain from about 75 acres to 500 acres, the size depending a good deal on the distance from a large town, and not on the suitability of the country, for most of Argentina's beef-producing country is eminently suited to dairying, and this cattle country covers millions of acres. Within reasonable distance from a large modern dairy factory, land which will carry with perfect safety a milking cow to the hectarea (2.47 acres) and rear all calves dropped, and this with the minimum of cropping and no fertilising whatsoever, is purchasable at 300 pesos to 350 pesos per hectarea, which means that a person taking British sterling to Argentina could buy the land at about £15 16s. to £18 8s. sterling per hectarea, but if purchased by an Argentinian at par would cost the equivalent of about £25 to £29 per hectarea in British sterling. This same land can be rented at from 18 pesos to 22 pesos per hectarea.

[From *Kinsella's Agriculture in Other Lands*.

Primitive Method of Delivering Milk in Parts of Argentina Although in most ways a very modern and up-to-date country, a few primitive practices still persist in Argentina, and one of these is the leading of cows around the suburbs of cities and extracting the required quantity of milk at the householder's door.

Many of these smaller dairy farms have no milking-sheds whatever, the cows being milked in the yards standing with two front legs strapped together and their hind legs also fastened to each other. Under these conditions it is quite impossible to attain that degree of cleanliness generally looked upon as essential for a human foodstuff like milk, particularly when a big slobbering calf is just as likely as not to be sucking at its mother from one side whilst a milker is extracting milk on the other side.

On the outskirts of Buenos Aires, and in country towns, some of the home-supply milk is delivered by driving cows to the door and milking the required quantity on the spot. Large herds are not used for the purpose, but a team of two or three cows tied together, with muzzled calves following, is not an unusual sight in country towns. It appears that very little milk is distributed by the producers, and it seems to be the practice for producers to bring milk twice a day to the town in 10-gallon cans, unload it at a depot, which is usually a section of a street footpath, and sell it from these cans to distributors.

The rather primitive and unhygienic handling of milk on many of the smaller dairy farms does not apply on the large dairy farms seen, and Argentina has some extremely large establishments producing milk. One of these, "La Martona," situated at Vicente Casares, to the south of Buenos Aires, maintains something approaching 25,000 pure-bred Friesian cattle, keeps more than 5,000 in milk all the year round, and has about 1,000 Herd-book cows for the production of bulls for use in the various herds, and for sale. This enormous herd of milking cows is subdivided into 50 herds, each containing something about 100 cows, and these smaller herds are worked by share farmers, while about 150 other men are permanently employed to grow crops and provide foodstuffs for the animals. Each share farmer has about 300 acres of land, and the equipment is standardised with dwelling, milking shed, milk room, brick silo 17ft. in diameter and 40ft. high, well, windmill, and water tank. This estate controls a large dairy factory at the railway siding, and has 100 retail shops in Buenos Aires for the sale of the factory products. About as much milk as that supplied by its own estancia is purchased from private dairymen, and besides fresh milk for town supply, butter and casein, "La Martona" makes large quantities of a highly sweetened condensed milk peculiar to Argentina, and known as Dulce de leche (Jam of Milk). This article is used in a similar manner to jam, and has a very sweet and pleasant flavour. Although only put up in tins with loose-fitting lids, it will keep sound and fresh for at least a month after manufacture.

Like "La Martona," the other large factories inspected were fairly well up-to-date and were certainly conducted hygienically and efficiently. In one, the cream-cooling room where the cream is exposed whilst passing over the cooler, had its walls painted blue, and the whole room was flooded with blue light as well, and there was certainly not a single fly to be seen in this part of the factory.

Although much of the butter seen in Argentina is of good texture and fair colour, it is not very tasty, and the absence of flavour is the more noticeable, because very little of it is salted during manufacture. It is not unusual to see people mixing salt with butter on their plates at table, and others can be seen sprinkling salt on the butter after it has been spread on bread.

It appears inevitable that Argentina must be an important dairying country some day because so much of the country is blessed with natural conditions almost ideal for this form of rural production, and she is so close to the European markets that dairy products will not deteriorate to the same extent as on a longer journey.

HORSES IN ARGENTINA.

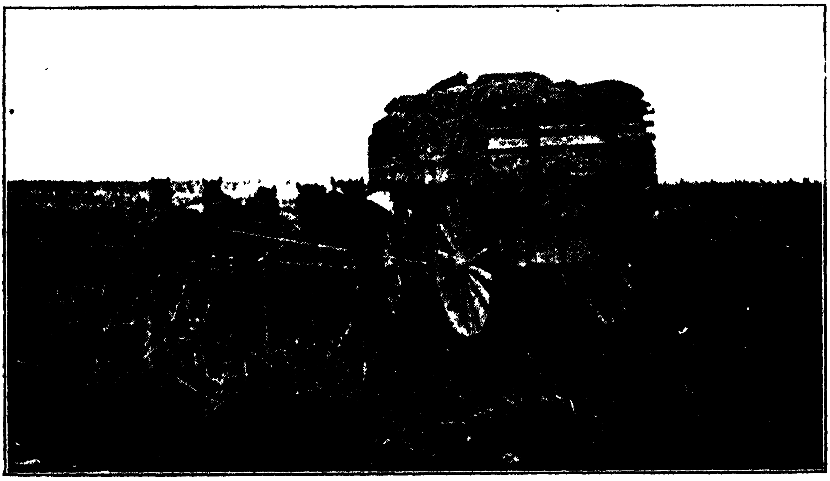
It is generally recognised that the first horses brought into the River Plate, from which most of the horses of the country have descended, arrived in 1535, and were Andalusian horses, supposed to have been of Arab and Berber blood. The country was so admirably suited to the production of horses that from the few that went wild in the early days it was estimated that in 1585, five years after the second founding of Buenos Aires, there were 80,000 wild horses in the surrounding plain. Some of the Governors of the country encouraged the breeding of these horses, by preventing their slaughter by Europeans, because they were good food for the native Indians, and they multiplied apace, and became a serious pest to settlers on the plain. The conditions of the Pampa were so good that these wild horses retained their size as well as stamina, and even to the present day the "criolla" horse is a very useful hack, stock-horse, and military charger, and still shows plenty of evidences of his Arab ancestry.

The number of heavy draught horses is not very great in Argentina, either in the towns or in country districts, and of these most of them are Percherons. The whole country possessed 9,858,111 horses at the 1930 census, and of the 2,215,559 shown as belonging to some breed or other, 1,310,754 are Percherons, 569,702 Thoroughbreds, 153,337 Clydesdales, and 124,155 Shires.

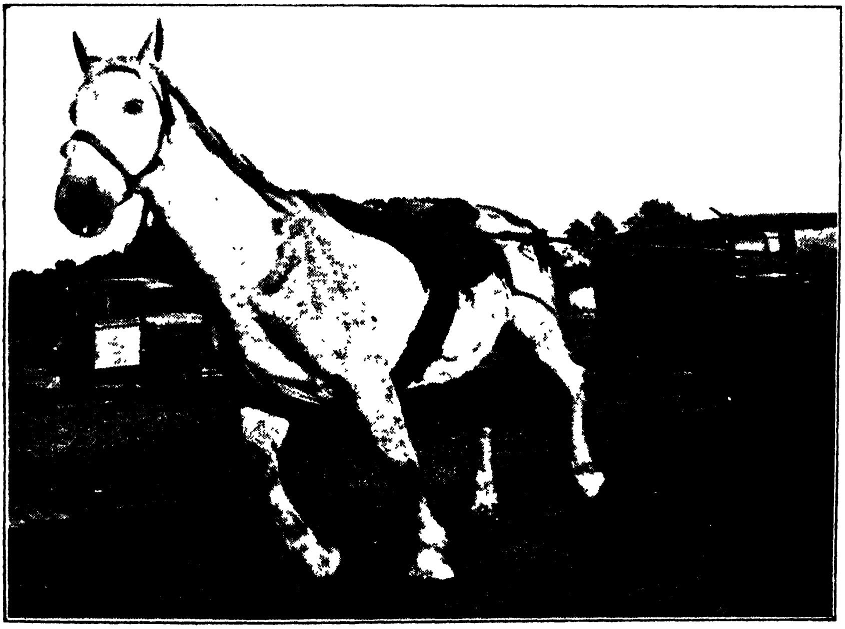
Horse Teams in Argentina.

There are no stones on the Great Plain of Argentina, and as a consequence, formed earth-roads are the rule in most of the best agricultural districts, and as the rainfall of much of this country is heavy, it is difficult to negotiate these roads in wet weather. When it is essential to cart heavy loads after rain, the waggon teams are formed in a unique manner. An ordinary five-horse team of two shafters and three leaders is reinforced with three "helper" horses, on each side of the leaders, making a line of nine horses in front of the two shafters. These "helpers" are not harnessed in the ordinary way, but wear bridle and a broad girth-band, and from the girth-band a single rope, attached about half-way down the ribs, extends back to the waggon. This rope-trace is attached to the left side of the "helpers" on the right hand of the ordinary leaders, and to the right side of those on the left hand. The inside "helpers" have their ropes attached to loops on the ends of the front-wheel axle; the middle "helper" on each side has a longer rope which hooks on to the side of the waggon, and the outside "helpers" have still longer ropes hooked near the back of the waggon. The "helpers" do not exert any pull when the waggon is going along freely, but should it get stuck in

An Argentine Wagon Team in Wet Weather. Wide-spread Horse Teams are encountered on the roads of the Great Plain of Argentina after heavy rain The complete absence of stones on the Great Plain means that there are few paved roads, and when it is necessary to cart heavy loads after rain the wagon teams are strengthened with three "helper" horses on each side of the leaders.



Method of Attachment of "Helper" Horses. "Helper" horses wear bridle, broad girth-band, and single rope for hauling purposes. The inside "helpers" have their hauling ropes attached to loops on the wheel-caps of the front axle; the middle "helpers" have longer ropes, which hook on to the sides of the wagon; and the outside "helpers" have still longer ropes hooked to loops on the wheel-caps of the back axle



[Photo. by Col. C. P. Butler.

A "Helper" Horse in Action. Whilst pulling the "helper" horses are allowed to roam a little from the direct line of pull, and at times almost lie on the ground in an effort to move a bogged wagon the mud their job is to get it moving again. Whilst pulling, the "helpers" are allowed to roam away from the direct line of pull, and as they are specially trained for the job, utilise their weight to full advantage. In a case demanding much effort these "helpers" almost lie on the ground, and it is generally recognised that they can shift much more than can horses pulling from the shoulders with two traces, but because of the girth-band surrounding the body they tire very soon.

In Buenos Aires the usual carrier's team consists of three horses in a spring trolly, two polers, and a single leader, and for some unaccountable reason the leader has chains so long that there is room for another horse between leader and polers. This method of harnessing the teams is quite general, but appears to apply in this city only and not in any of the country towns, whatever their size.

Amongst farm horses turned out to graze, occasionally pairs coupled together with chains around their necks, allowing them to separate about 3ft., were to be seen.

POULTRY IN ARGENTINA.

Although large numbers of poultry of various kinds are maintained in Argentina, the export trade has not yet reached very great dimensions. In 1934, eggs to the number of 1,870,317 dozens were exported, and a very good start has been made this year in the export to England of dressed Pekin ducks, but poultry is such an important foodstuff in the country that the home market takes a lot of satisfying, and prices are quite fair. Plenty of poultry are to be seen in various parts of Argentina, but a high proportion of the birds are just barnyard fowls, and but few high-class pure-breds were encountered, and of these Plymouth Rock and Rhode Island Red appear to predominate.

The 1930 census gave the following numbers of the various kinds of poultry:—

Hens	22,500,000
Roosters	14,928,427
Turkeys	1,937,395
Ducks	1,437,709
Geese	403,296
Pigeons	5,863,164

SUMMARY OF IMPRESSIONS GAINED IN ARGENTINA.

1. Argentina is essentially an agricultural country, having neither coal nor iron.

2. The shape of the country is almost triangular, and it is bounded by Chile on the west and south, Bolivia on the north, Paraguay, Southern Brazil, and Uruguay on the north-east, and the Atlantic Ocean on the east, and covers an area of about 690,000,000 acres.

3. The so-called River Plate is an estuary formed by the Rivers Paraná and Uruguay. The Paraná is one of the big rivers of the world, being 2,800 miles in length, and navigable for steamers for quite 700 miles from its mouth. The Uruguay is also a large river, 940 miles in length, and is used by steamers for some hundreds of miles.

4. There are no important rivers crossing the Great Plain of Argentina, but to the south of it there are several which cross from the Andes to the sea through the low-rainfall area, and the smaller streams coming from the Andes are almost countless.

5. So many peaks of the Andes, the ridge of which range forms the western boundary of Argentina, are permanently snow-capped that melting snow keeps the rivers well supplied with water.

6. The Great Plain of Argentina is about 1,200 miles long, and for most of its length is about 400 miles wide, and in the whole of this expanse there are two small ranges only, which start near the sea coast and jut into the plain.

7. The Great Plain of Argentina is one of the greatest and most important strips of agricultural country in the temperate and subtropical regions of the world, for it has all that is desired for promoting prolific growth. There are no physical

difficulties to agricultural operations, the soils are fertile, deep and free-working, the rainfall of most of it is at least 24 inches per annum on the average and up to 48 inches, and wonderfully distributed. The temperatures may be fairly high in summer but are rarely low in winter, and underground water is plentiful at relatively shallow depths.

8. There are few other countries occupied by the one people and controlled by the one Government which are so favourably situated as is Argentina in so far as climate is concerned.

9. Of the total area of 690,000,000 acres it is officially estimated that about 198,000,000 acres are suitable for cereals, about 269,000,000 for crops and livestock, about 124,000,000 acres occupied by forests and woods, and about 99,000,000 acres are unsuitable for livestock.

10. Although the progress of the country was delayed by almost continuous fighting, a wave of rapid development has commenced and will certainly continue unless the difficulty of finding markets persists.

11. With the small population of 12,000,000 people, Argentina is the greatest exporter of beef in the world, produces nearly half the world's linseed, is the greatest exporter of maize, the second largest exporter of wheat, manufactured over 172,000,000 gallons of wine in 1932-33, is rapidly becoming an important exporter of apples and pears, and is multiplying her production of other crops and livestock very quickly.

12. Exports of wheat vary from season to season, but reach about 150,000,000 to 170,000,000 bushels per year.

13. Unlike Australia, the type of wheat grown consists very largely of the small-grained, red wheats rich in protein.

14. Although Argentinians are big meat-eaters, they also consume about a similar amount of wheat per head of population as do Australians.

15. Terminal grain elevators, with modern cleaning and grading equipment,, are provided at shipping ports, but as country silos are not very plentiful, and as much of the wheat is shipped in bulk, bags must be opened on arrival at the ports.

16. The possibilities of extending the production of wheat in Argentina are really great, both by increasing the area sown and improving the yields.

17. Argentina is a very big exporter of maize, and for the 1934-35 season it is estimated that her surplus for export will reach about 7,500,000 tons.

18. Other than the danger of attack by locusts in portions of the area, Argentina has almost ideal maize-growing conditions over a tract of something approaching 200,000,000 acres.

19. Argentina is easily the most important producer of linseed in the world, and exports annually about 1,500,000 tons, and can easily increase the amount produced.

20. The production of wine is one of the important agricultural activities of Argentina, and in 1933, manufacturers produced 172,458,000 gallons.

21. Table grapes are being grown extensively and a considerable export trade is being developed.

22. Most fruits do very well in Argentina, and at present the growing of apples and pears for export is being encouraged. Such good results are being achieved with these fruits, exporting overseas has commenced, and planting of new orchards is being continued, that it seems certain that this country will become a very important shipper of apples and pears in the near future.

23. Besides pears, apples, and grapes, Argentina is an exporter of peaches and a few tons of citrus fruits.

24. Yerba Maté is becoming an important crop in Argentina. At present about 110,000 tons of this tea are used in the country, but only about one-half of this is produced within her borders, the remainder coming from Paraguay and Brazil.

25. Most crops required are grown in the country, except that half the Yer Maté and tobacco, two-thirds of the rice, some fruit (mainly pineapples a bananas), and despite the high production, some wine, are imported.

26. Besides the more important crops, Oats, Barley, Rye, Canary Seed, Cotton, Potatoes, Sunflower Seed, and Rape Seed are exported in fairly considerable quantities, and the production of Peanuts has passed the local-requirement stage.

27. The pastures of Argentina have been good for hundreds of years, but in some places weeds have become so bad that it is necessary to establish introduced pasture plants to keep up the stock-carrying capacity.

28. The conditions obtaining in much of Argentina are so favourable to the luxuriant growth of Lucerne that good pasturage is easily developed, and this crop is so favourably known in the country that 13,353,907 acres are under Lucerne at present.

29. Judged by Australian standards, good lucerne-growing land can be bought at relatively low prices in Argentina.

30. Large areas are seeded in the early autumn to Rye or Oats, and are generally used for the weaning of calves or the topping-up of steers.

31. Forage Sorghum and Sudan Grass are becoming increasingly popular as it is found that steers fatten very readily if they have access to one of these crops and Lucerne at the same time, and both of the crops help to smother out Couch Grass.

32. Of other useful pasture plants probably Couch Grass, Prairie Grass, and *Paspalum dilatatum* are the most valuable at present, at all events in the cattle country.

33. Weeds are very prevalent in the country, and they spread so quickly and grow so strongly that they are a great trouble, particularly where cropping is being practised.

34. Locust plagues are probably the greatest pest that crop-growers have to contend with, and there are provincial laws compelling farmers to combat these insects when they appear.

35. Even in the best of the Lucerne-growing districts large quantities of hay and silage are stored against the short-period drought which occasionally occurs.

36. At the present time something approaching 4,000,000 acres of land are regularly irrigated, which includes practically all of the vines, most of the fruit-trees, and limited areas of almost all other kinds of crops.

37. The possibilities of extending the area under irrigation are enormous, for two large rivers, several good rivers, and scores of small streams, all fed by melting snow as well as rain, are running alongside of fertile land easily watered.

38. About 30 per cent. of the value of the total exports from Argentina is earned by livestock products.

39. Argentina is blessed with agricultural, freightage, and economic advantages for the production of farm livestock, which are much in advance of most other countries, and particularly for beef cattle.

40. At present the best beef cattle in the world are produced in Argentina in large numbers.

41. It is estimated that in 1780 the Great Plain was supporting 48,000,000 head of cattle, most of which were wild, and they were shot down for their hides.

42. In the early part of the Nineteenth Century the production of salted meat for export was encouraged, and some progress was being made in this direction by 1882, when the first frigorifico was established in the country.

43. There are over 32,000,000 cattle in Argentina, and of the 23,000,000 of which the breeding is known, 18,109,465 are Shorthorns, 2,786,064 are Herefords, 1,256,189 are Aberdeen Angus, 12,121 are Red Polled, and there are a few each of Sussex, Devon, Zebu, and West Highland.

44. To keep to the desired low-set rapid-maturing type of beef cattle it is necessary to introduce frequently top-sire bulls from Great Britain.

45. Argentina maintains a large, well-equipped and hygienically-maintained quarantine station at Buenos Aires to prevent the introduction of diseases into the country.

46. In the best of the cattle country heifers are mated when 15 months of age because of their early-maturing propensities and the tendency to put on fat.

47. It is usual to have an autumn and a spring calving.

48. The calves are rarely weaned before nine months of age and are sometimes left until the next calf arrives.

49. The growing steers are frequently reclassed and this is sometimes done over the weighbridge.

50. A great deal of attention is given to colour breeding to make certain that unattractive colours are eliminated.

51. Practically all steers throughout the whole of the cattle country are dehorned, and nowadays buyers of chillers will not look at steers carrying horns.

52. Cattle-men have a lot of diseases and pests to contend with, of which the worst are probably Foot-and-Mouth Disease and Cattle Tick.

53. The veterinary inspection of cattle sold for export is particularly strict in Argentina.

54. Most of the transport of cattle to the frigorificos is done by railway or cattle boats, and the animals generally arrive in really good order.

55. All cattle are purchased by live weight, and usually by private negotiation, or, as they say, "by ear," rather than by public auction.

56. In the Buenos Aires cattle saleyards there are over 1,000 saddled horses in use; all the movements of cattle are done by horsemen, and cattle buyers give their bids from horseback.

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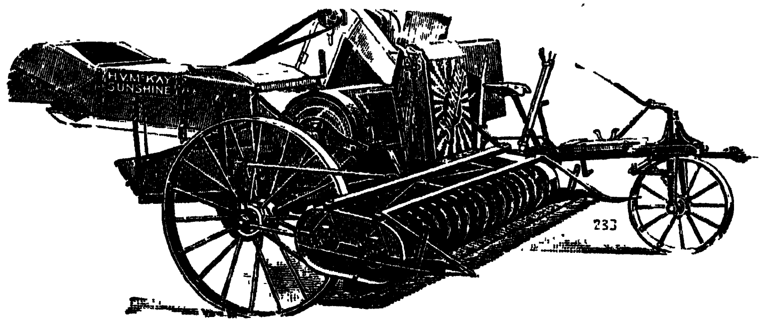

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57. The frigorificos, which do all of the slaughtering for export and quite a lot for local consumption, have modern equipment and are efficiently and hygienically conducted.

58. Great care is taken to see that the hides are removed carefully, and cutting or scoring leads to severe penalties.

59. The inspection of beef intended for export is very thorough, no portion going into the cool chamber without close scrutiny, whilst all important glands are exposed and cut open.

60. About 6,700,000 head of cattle are slaughtered annually in Argentina, of which about 1,700,000 are exported.

61. As a producer of baby beef Argentina stands alone, and she produces hundreds of thousands of steers weighing 1,100lbs or more by the time they are two years old.

62. In the better portions of the cattle country young fattening steers are expected to increase in weight at the rate of 45lbs. per month.

63. At the last census (1930) there were 44,413,221 sheep in Argentina.

64. The first flock of Merino sheep was established in Argentina in 1818, and there are now about 14,000,000 sheep of this breed in the country.

65. The other breeds of sheep of importance are Lincolns with about 14,500,000 head, Romney Marsh with about 7,500,000 head, and Corriedale with about 3,400,000 head.

66. The natural conditions are very favourable for cattle, and, if required, might be used for the production of mutton and fat-lamb carcasses, but it does not appear as though Argentina will ever become a highly important Merino sheep country.

67. Argentina exports about 3,000,000 carcasses of lamb and 500,000 carcasses of mutton per year.

68. Wool sold in Argentina, which is unclassed on arrival at the wool stores, is stacked on the floor, sold privately, carted to a classing and baling store, and the unwanted portion sold again.

69. Pigs have rapidly become important in Argentina, and the number in the herds reached 3,768,738 in 1930.

70. The type of all breeds of pigs maintained in any large numbers in Argentina is being rapidly altered to fulfil present-day requirements.

71. The judges of pigs at the principal agricultural shows judge all breeds to the one type, and to ensure this, have a silver model of an ideal pig about 2ft. in length placed before them immediately prior to commencing judging.

72. Some of the larger breeders of pigs in Argentina breed, rear, and sell as baconers about 20,000 animals a year.

73. The large-scale breeding of pigs as practised in Argentina is very spectacular, but it is doubtful if it is more economic than the methods of some other countries.

74. Argentina is not an important dairying country so far, but can easily become so when conditions warrant it.

75. There are not a great number of very good heavy draught horses in Argentina, but the saddle horses and lighter types of workers are really good, and generally very well cared for.

76. Poultry form a very important article of diet throughout Argentina, but the quantities of poultry products exported are not very great.

(To be continued.)

BLOW-FLY STRIKE IN SHEEP.

[Reply supplied by Mr. C. McKenna, B.V.Sc., M.R.C.V.S. (Government Veterinary Officer) to a question, "What is the best method of dealing with the blowfly pest?" asked by the Kyancutta Branch at the Agricultural Bureau Conference held at Wudinna on 18th October.]

Recent experimental work carried out by the Blowfly Committee appointed by the Council for Scientific and Industrial Research and the New South Wales Department of Agriculture has shown that the successful handling of "Blowfly Strike" is not to be obtained by any one method alone.

Those methods recommended by the Committee which the farmer in our agricultural areas can put into practice are:—

CRUTCHING.

This is intended to prevent "crutch strike," and if properly undertaken its value is undoubted. The wool should be shorn close over an area extending from above the tail, down each side of the breech (well outside the pin bones) to include the crutch (between the hind legs), and down the back of the legs to the hocks. Crutching is generally restricted to ewes and rams, as crutch strike in wethers is of much rarer occurrence. Wethers, however, may be "pizzle rung" to prevent fouling around the opening of the sheath (do not remove the long, straight hairs growing from the end of the sheath). The same is usually done to rams. If crutching is done during the early summer (as well as close to lambing as possible), it assists considerably in preventing strike during the summer.

REDUCTION OF SUSCEPTIBILITY.

It can be said that the great majority of crutch strikes are brought about by the wrinkly conformation of that part of the body. This is inherited. This type of conformation is, of course, recognisable in rams as well as in ewes, and by selection and breeding it may be reduced in a flock. In this respect, special attention should be paid to the ram. It is considered that satisfactory wool quality can be retained by judicious selection. Sheep which are narrow behind and have their hocks approaching each other are more prone to be struck than are wide open hocked sheep. The culling of specially susceptible ewes at classing will remove many of those sheep which are so frequently struck that they are a continual source of trouble to the owner, and moreover it will prevent the propagation of their kind.

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The Mules operation is briefly the excision of the folds of the breech by pinching them with Burdizdo pincers, and then cutting them off inside the jaws with a knife. Lambs can be treated at three weeks old or younger if necessary When efficiently carried out this operation, like selective breeding, produces sheep with plain breeches, and has given good results in reducing susceptibility to strike

CARCASS DESTRUCTION

This is a sound sanitary procedure, as carcasses provide a breeding ground for blowflies The best method of dealing with carcasses is to bury deeply Prior to burial the carcasses should be sprinkled with arsenical sheep dip powder, as flies emerge from a buried carcass that has not been treated with poison.

OTHER PREVENTIVE MEASURES.

Adequate water supplies should be available, so that the sheep do not have to wait about for a drink, and if possible plenty of shade should be provided Attention to these points will prevent sheep from crowding together, which is very undesirable when strike is severe Keeping sheep yarded unnecessarily long is also to be avoided, and indeed all yarding should be reduced to a minimum when flies are troublesome

TRAPPING

No definite opinion can be expressed as to the value of trapping The trapping should be systematically carried out, particularly prior to and during periods of strike Traps should be placed where sheep congregate, *e g* day camps, yards, and near watering places In hot weather they should be placed in the shade

DRESSINGS FOR FLY STRUCK SHEEP

As regards the treatment of struck sheep it is desirable to emphasise two points, namely, the necessity for —

(*a*) Early detection and treatment of strike

(*b*) Proper preparation of the "struck" area prior to dressing

In regard to the latter, the wool over and for at least an inch around the struck area should be shorn off close to the skin At the same time all "daggy" matter or soiled wool about the breech should be removed

The maggots in the struck area should then be dealt with if possible all being removed prior to dressing This is usually done by striking the area sharply with the flat side of the shears Generally there remain a few maggots which have burrowed down near the skin or into wrinkles, and, when dressing, care has to be taken that the preparation penetrates to these recesses Maggot infested crutchings should be destroyed The dressings recommended are —

(*a*) A 5 per cent watery solution of zinc sulphate

(*b*) A 4 per cent solution of phenol (carbolic) crystals in whale oil

Note.—A 5 per cent watery solution of copper sulphate (bluestone) is satisfactory except for the staining and harshness imparted to the wool Research workers of the Council for Scientific and Industrial Research have recently advised that the following dressing is worth a trial It is made as follows —

Add 3lbs. of powdered boric acid (boracic acid) to 13lbs (1gall) of glycerine This forms a thick paste, which is heated and stirred until all the boric acid has dissolved. It is then cooled and stirred

Any convenient tin or other receptacle may be used for manufacturing the preparation It must not be diluted with water, and should be kept airtight in bottles or tins, because the boric acid tends to separate out on exposure

IMPORTANT WEEDS OF SOUTH AUSTRALIA.

[By G. H. Clarke, B.Sc., Botanist at the Roseworthy Agricultural College.]

Nos. 17 and 18.—CAPE TULIPS.

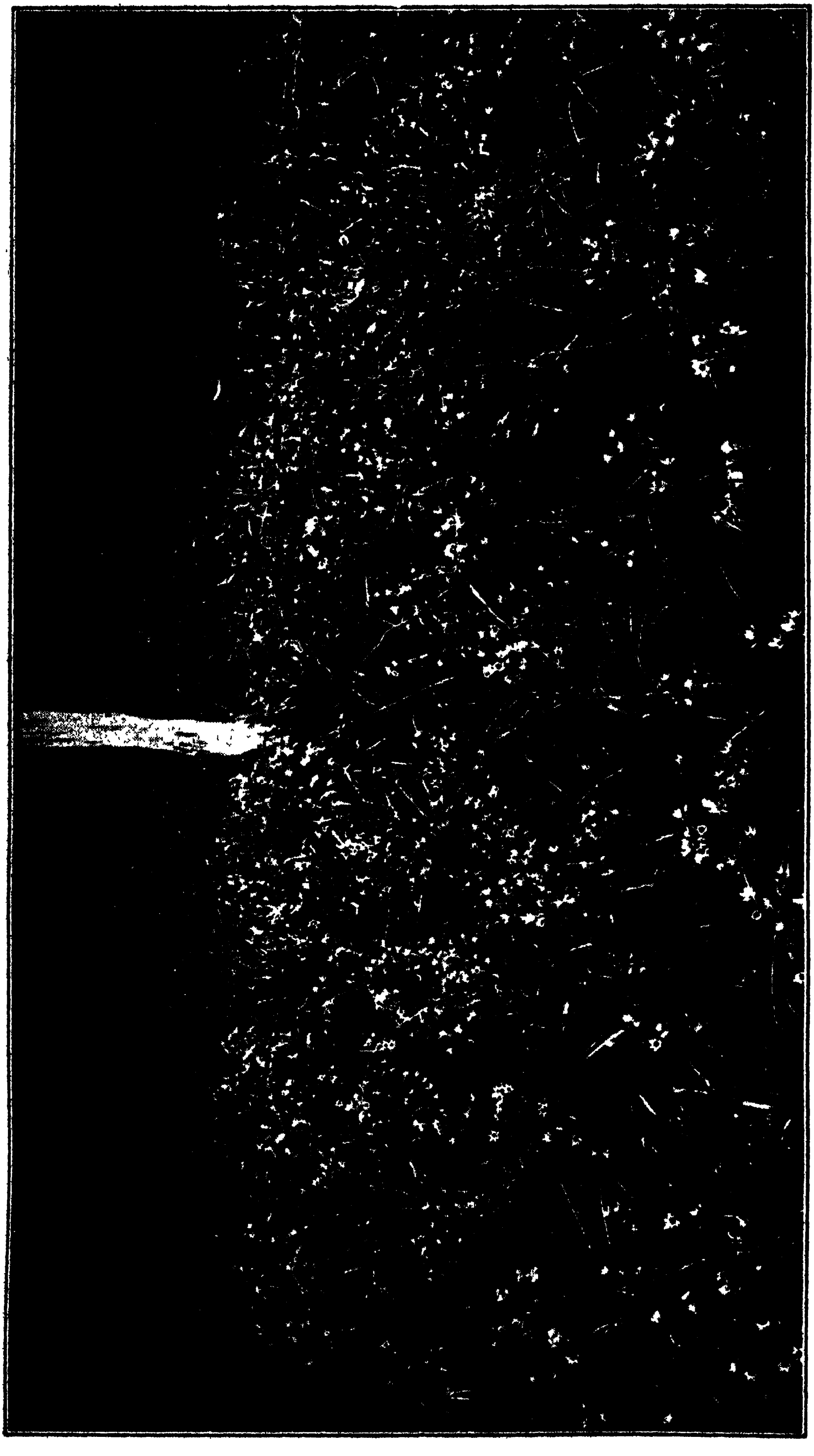
Two-leaved Cape Tulip (*Homeria miniata*, Sweet).

One-leaved Cape Tulip (*Homeria collina*, Vent., var. *aurantiaca*, Sweet).

The name "Cape Tulip" is applied, in this country, to two introduced species of *Homeria*, a South African genus of Iridaceous plants allied to such garden types as Irises, Gladioli, Watsonias, Freesias, Ixias, and others. Like many other representatives of the Iris family, *Homeria* propagates itself, in addition to forming seeds, by the development of underground bulb-like organs termed *corms*, the size and number of which, produced per plant, constitute, in this case a point of difference between the two species here to be described. Both Tulips are closely similar in appearance, and in the form and colour of their flowers, which are of an orange- or salmon-red shade. The most noticeable difference between them is in the number of produced leaves, on which account they are distinguished, respectively, as the "Two-leaved" and the "One-leaved" Cape Tulip, the stem of the first bearing two long slender ribbed leaves, and, in the second case, only a single one. Differences are also to be seen in the size and number of the flowers, those of the two-leaved plant being smaller and more numerous than those of the one-leaved form. Both species grow from corms, but the Two-leaved Tulip bears, in addition to these, large numbers of miniature corms termed *cormils*; these are formed both above and below the ground, in the axils of the leaves and corm scales. The production of cormils, several hundred of which may be formed by a single plant, and every one of which is capable of developing a new individual, makes the Two-leaved Cape Tulip one of the most difficult of weeds to eradicate. It is the one infesting the Adelaide Parklands, and that most frequently met with on the plains. The two-leaved form, however, does not seem to spread as rapidly as the other, so long as its distribution is not assisted by the transport of cormils or corms; the One-leaved Tulip, which is common in the hills and foothills near Adelaide, has an equally bad reputation, and, indeed, is regarded by some as the more serious of the two species. Both plants are notoriously bad poison weeds, and undoubtedly present the most serious weed problem confronting this State.

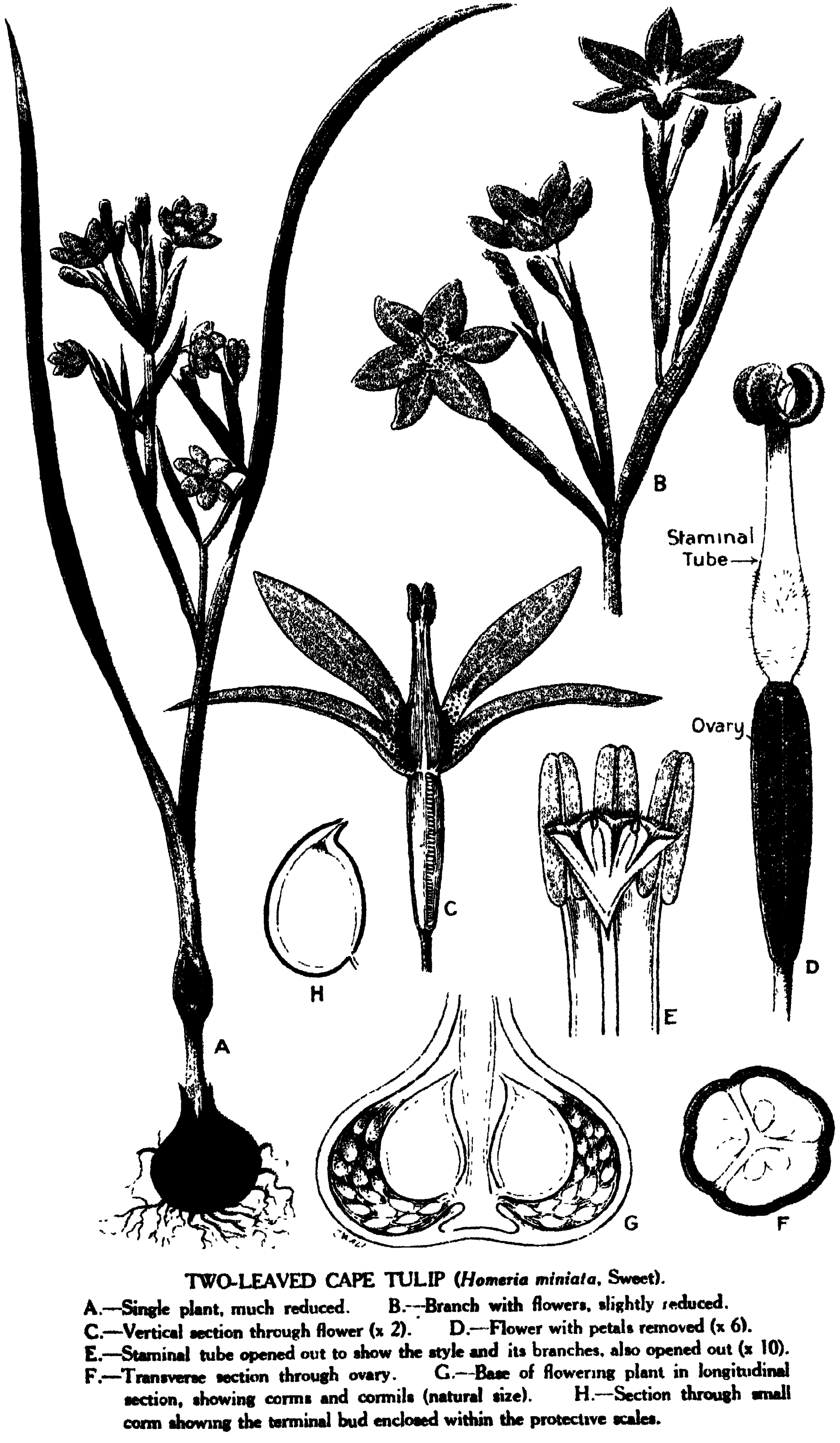
Both species of Tulip are poisonous to stock, and are usually avoided by animals accustomed to graze in localities where the weeds are abundant. This explains the fact that, though Cape Tulip poisoning is a common trouble and one often attended with serious fatalities, the number of cases is not large when considered in relation to the wide distribution of the weeds. But stock not used to the presence of the Tulips readily fall victims to its poisonous effects. In South Africa, the *Homerias*, in common with a number of allied plants of similar habit, are called "Tulps"—a corruption of "Tulips"—and are of importance there, as here, on account of their poisonous nature. Tulp-poisoning is a well-known trouble with stock in South Africa; during the Boer War it was responsible for many fatalities among army horses and transport oxen.

History of Introduction.—While the One-leaved Tulip seems to have been introduced as a garden plant early in the history of South Australia, it is uncertain just how or when the two-leaved form first made its appearance here, though it is probable that the two were brought in indiscriminately under the one name. Unfortunately, the two species do not appear to have been clearly distinguished until both had become established as weeds. Assuming that the specimens



Patch of Two-leaved Cape Tulips (*H. miniata*). See coloured plate opposite.

Supplement to the *Journal of Agriculture*, South Australia.]



TWO-LEAVED CAPE TULIP (*Homeria miniata*, Sweet).

A.—Single plant, much reduced. B.—Branch with flowers, slightly reduced.
C.—Vertical section through flower (x 2). D.—Flower with petals removed (x 6).
E.—Staminal tube opened out to show the style and its branches, also opened out (x 10).
F.—Transverse section through ovary. G.—Base of flowering plant in longitudinal section, showing corms and cormils (natural size). H.—Section through small corm showing the terminal bud enclosed within the protective scales.

planted were true to label, the One-leaved Cape Tulip was evidently grown, under the name *Bobartia aurantiaca*, Sweet, in the Botanical Gardens, Adelaide, as early as 1859, which is the date of issue of the first catalogue of plants under cultivation there; and it may have been introduced earlier than this. In this first catalogue, compiled by the late Mr. G. W. Francis, there are listed, also, *Homeria edulis*, Vent., and *Homeria longifolia* (?) In the subsequent catalogues issued by the late Dr. Schomburgk, in 1871 and 1879, respectively, neither of these names appear; but, under *Homeria*, we find listed *H. collina*, Vent., and under *Bobartia*, again, *B. aurantiaca*, Sweet. While the identity of the plants referred to in the first catalogue as *Homeria edulis* and *Homeria longifolia*, respectively, remains uncertain, the suggestion is here made that the *Bobartia aurantiaca* of all three catalogues was identical with our present One-leaved Tulip, and that the *Homeria collina* of the two later catalogues may have been the yellow flowered variety, formerly regarded as the type of *H. collina*, but subsequently distinguished by J. G Baker as the variety *ochroleuca* Baker's *Handbook of Irideae* was published in 1892, and the description, by that author, of the *Iridaceae* in the *Flora Capensis* appeared in 1896-7; both publications were thus issued only *after* attention had been drawn, in this country, to the potentialities of Cape Tulip as a poison weed. According to Baker (*Flora Capensis*), the type of *Homeria collina* has flowers of a deep red colour, and the species presents three varietal forms; namely, a variety *aurantiaca* (= *Bobartia aurantiaca*, Sweet), the variety *ochroleuca* with yellow flowers, already mentioned, and a third variety, *bicolor*, in which the flowers are yellow with a lavender throat. The first of these differs from the type, not only in the colour of the flowers, which are of a lighter, more orange, red, but also in having narrower, and more pointed perianth segments, each of which has a yellow base or claw. This is the plant figured in *Curtis' Botanical Magazine* (T.1612) under the name *Moraea collina* var. *miniata-minor*, and it is undoubtedly the same as our One-leaved Cape Tulip. There seems little doubt that this plant escaped from cultivation in various places during the years following its introduction. The following extract from the *Garden and Field* of November, 1903, is of interest in this connection, and it illustrates the confusion between the two species of Tulip:—

> "The 'Cape Tulip' is a variety of *Homeria collina* described in the old books as *Moraea* and as *Bobartia aurantiaca*. It is like the sparaxis, oxalis, and many other well-known bulbs, a native of the Cape of Good Hope, and is esteemed in Europe as a greenhouse bulb, being quoted in the catalogues at 2s 6d. per 100, or 1d per bulb
>
> "The varieties of *Homeria* (yellow and orange to orange-red) not infrequently seen in our gardens this season, and *the strayed representatives of the same which are spreading in the hills districts, do not appear to multiply as rapidly as the one photographed.*"

I have placed the last part of this in italics because, as the illustration accompanying the article shows, the *one photographed* is the Two-leaved Tulip (*Homeria miniata*), whereas the *strayed representatives* referred to are, presumably, one-leaved forms (*H. collina*). Owing to the very numerous cormils formed by the first, its power of vegetative multiplication is much greater than that of the second, and it forms much denser infestations. But whether it spreads more rapidly than the one-leaved species is, however, doubtful, since it may not be as efficient as the latter as regards the formation, dispersal, and germination of the seeds.

Owing to the confusion between the two forms the mode of introduction of *Homeria miniata* is obscure, though probably both were introduced together and sold as *Bobartia aurantiaca*, and later as *Homeria collina*. Loudon's *Encyclopaedia of Plants* gives the date of introduction, into Britain, of *H. miniata* (Figure 17692, p. 1233) as 1825, as against 1768 for *Moraea* (*i.e.*, *Homeria*) *collina*

(Figure 807, p. 47). Though described as separate species by Sweet (*British Flower Garden*) early in the 19th century, *Homeria miniata* has, until comparatively recent times, been regarded by most authorities as a variety of *H. collina*, with which it is still listed as conspecific in the *Index Kewensis*. Since the specific name *collina* has been applied to both plants, it is often impossible to ascertain from the early records which of the two forms is the one referred to. The confusion has been all the more natural in this country owing to the close similarity between the two as regards flower colour.

The first descriptive account of Cape Tulip to appear in this *Journal* was written by Mr. W. L. Summers, in 1903, with the following opening remarks:—

> "Early in the history of the Agricultural Bureau, about the beginning of 1889, I believe, attention was directed to the presence of an imported bulbous plant near Myponga, where it was reputed to have caused the death of some cattle. This plant was identified by the late Dr. Schomburgk as *Bobartia aurantiaca*, a native of Cape Colony, and where it bore a well-proved reputation of being poisonous to stock. Later on the name was given by the late Baron von Mueller as *Homeria sp.*, probably *H. lineata*. Subsequently specimens were submitted from Victoria to the Government Botanist, Cape Colony, who reported to Baron von Mueller, in connection with reputed cases of cattle poisoning at Pascoe Vale, near Melbourne, in 1892, that the plant was the red-flowered variety of *Homeria collina* *(*the ordinary form of which bears flowers of a sulphur yellow colour*), and that it was undoubtedly poisonous. In 1893 a bulletin was issued by the Victorian Agricultural Department concerning the poisonous nature of this weed, leaving but little doubt that it was the agent responsible for the deaths of nearly 20 head of cattle in one paddock in the course of a few days."

The illustration accompanying Mr. Summers' article is of the Two-leaved Tulip (*H. miniata*), and was reproduced from the Victorian bulletin referred to, thus indicating the identity of the Victorian plants. But it is not clear that the South Australian plants submitted to the late Dr. Schomburgk, and identified by him as *Bobartia aurantiaca* were necessarily the same. From the localities given by Mr. J. M. Black in the *Flora of South Australia*, namely, "Pasture in southern districts and South-East" for *H. collina*, as against "Adelaide Plains and Mount Lofty Range" for *H. miniata*, it would appear more likely that they were of the one-leaved type, though both species were undoubtedly then present in this State. In the *Journal of the Bureau of Agriculture* of Western Australia for December, 1894, a brief account was given of the Two-leaved Tulip under the name *H. lineata*. In the *Agricultural Gazette* of New South Wales for February, 1904, the late Mr. J. H. Maiden recorded *H. collina* from Penrith, New South Wales. Thus, whatever may have been the original date of introduction of the Cape Tulip into Australia, it is evident that one or both species were established as weeds in Victoria, South Australia, and Western Australia, during the early nineties, and appeared in New South Wales not long afterwards. While the Two-leaved Tulip seems to have been the one first noticed in Victoria and Western Australia, and doubtless occurred in South Australia at that time, the one-leaved plant may have been the one whose poisonous properties were first suspected in this State.

While the two forms are much alike in certain respects, a comparison of the two coloured plates† will show that there are marked differences between them, not only as regards the number of leaves, the presence or absence of cormils, and the size and number of the flowers, but also in the detailed structure of the latter, and especially of the style branches. These differences are so very striking that it is difficult to accept any other view than that the two plants are specifically quite distinct.

*The italics are mine. The "ordinary form" referred to is the variety *ochroleuca* of Baker. *Vide* my remarks above concerning the date of publication of J. G. Baker's *Handbook of Irideae*.

†The second part of this article, together with an illustration in colour of the One-leaved Tulip (*Homeria collina*) will appear in the next issue of this *Journal*.

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Botanical Name.—The name *Homeria,* it is generally agreed, comes from *homereo,* "to meet," in allusion to the united stamens of the flower, and is not in honour of the Greek poet, Homer, as has sometimes been stated. In *Homeria,* and also in certain other genera, the filaments of the stamens are joined together to form a tube surrounding the filiform style of the flower, the three anthers being sessile at the top of this tube, with their pollen sacs directed outwards, and their backs in contact with the petaloid branches of the style. *Collina* means "pertaining to a small hill" and, therefore, "growing on low hills"; the one-leaved plant does seem to prefer hilly country, *e.g.*, Clare, Mount Pleasant, Tweedvale, Highbury, Glenunga, &c., whereas most of the writer's specimens of the two-leaved species have been collected on flat country, *e.g.*, Roseworthy, Freeling, Gawler, Adelaide Parklands, &c. *Miniata* means "coloured like cinnabar or red lead" and refers, of course, to the flowers, which, in many specimens of both species, are very nearly this shade, though the yellow bases of the perianth segments gives a more orange effect to the colour of the flower as a whole.

The Family.—*Homeria* belongs to the *Iridaceae,* a family of some 800 species of mostly perennial herbs with two-ranked, equitant, leaves, and growing from underground rhizomes or corms, and sometimes from bulbs. The difference between a corm and a bulb is, of course, that the first is a solid structure enclosed within thin scale-like leaves, whereas the second, *e.g.,* an onion, is composed mainly of thick fleshy leaves, the outer leaves alone being thin and scale-like. The family has a wide distribution, but is especially well developed in South Africa and tropical America. It differs from the *Liliaceae,* to which belongs the Wild Onion (*Asphodelus fistulosus*), chiefly in the inferior position of the ovary of the flower, and in the absence of an inner whorl of stamens. The Iridaceous flower thus consists, typically, of two perianth whorls of three segments each (usually united below to form a tube of varying length), a single whorl of stamens corresponding in number and position with the outer perianth segments, and a whorl of three united and inferior carpels, the ovary ripening to form a capsular fruit with usually numerous seeds. The ovary is continuous above with a style, which terminates in three branches. The style branches are often petaloid, sometimes, *e.g.*, in *Iris,* markedly so.

The Genus.—The characters which distinguish *Homeria* from other genera of *Iridaceae* are (1) the almost complete absence of a perianth tube, (2) the union of the staminal filaments to form a tube surrounding the style, (3) the linear sessile anthers placed opposite the style branches, (4) the detailed structure of the style branches, and (5) the inferior club-shaped ovary and resulting fruit, which is not enclosed in the spathe valves and opens at the apex only.

The number of species of *Homeria* recognised by different authorities varies considerably. Bentham (*Genera Plantarum*) gave 5, and the *Index Kewensis* originally listed 4 species; Marloth (1915) gives 6, Thonner (1915) 12, Phillips (1926) 15, Willis (1931) 8. During the past 15 years a number of new species have been described, chiefly by L. Bolus (*Ann. Bolus Herb.*), and by N. E. Brown in the *Transactions of the Royal Society of South Africa.* Most of these have been included in the later supplements to the *Index Kewensis,* according to which the total number is now 25, and one or two have been described since then. Evidently the genus is in need of revision. In the *Flowering Plants of South Africa,* a publication similar in pattern to the *Botanical Magazine* and beautifully illustrated with coloured plates, the Editor, Dr. I. B. Pole Evans, C.M.G.., remarks in the course of a description of *H. Cookii* that "*Homeria* has not received the attention it deserves from the systematist, and until recently has been studied chiefly from dried material where, owing to the fugacious nature of the perianth and stigmas, floral characters have scarcely been used."

BOTANICAL DESCRIPTIONS (from *Flora Capensis*).

(1) *Homeria miniata*, Sweet. Corm globose, with thick rigid black cancellate tunics; produced leaves 2, linear, rigid in texture, overlapping the stem, without a white central band, sometimes with bulbillae (cormils) in their axils; stem ½-1½ft. long; clusters several, on short erect peduncles; spathes cylindrical, 1½-2in. long, the valves green and firm, except the long scariose tip; perianth fulvous, ¾-1in. long, the segments subequal, oblanceolate, ¼in. broad, obtuse; stamens half as long as the perianth; anthers much shorter than the column of filaments; ovary clavate, trigonous, ½in. long. In flower—Sept. and Oct.

(2) *Homeria collina*, Vent. Corm globose, ¾-1in. diameter, with thick, dark brown, cancellate tunics; produced leaf 1, linear, rigid in texture, strongly ribbed, glabrous, 1½-2ft. long, ¼-½in. broad; stem 1-1½ft. long, with 1-4 clusters, the side ones on short erect peduncles, and several lanceolate, sheathing rudimentary leaves of firm texture; spathes cylindrical, 2-3-flowered, 2½-3in. long, valves cuspidate, firm in texture, except the tip, closely ribbed; perianth limb bright red, 1¼-1½in. long, the segments oblanceolate-oblong, obtuse, ⅜-1in. broad, with a yellow throat inside; stamens ½-⅝in. long, the anthers as long as the tube of filaments; ovary clavate, ¾-1in. long; style crests minute, subquadrate; capsule clavate, an inch long.

Var. *aurantiaca* (Sweet). Habit more slender; leaf narrower; segments of perianth light scarlet, with a yellow claw, narrower and more acute. In flower—Aug. to Nov.

(*To be continued.*)

HAND-REARING OF MOTHERLESS FOAL.

Replying to a member of the Boor's Plains Branch of the Agricultural Bureau, who asked for the best method of hand-rearing a motherless foal, Mr. C. McKenna, B.V.Sc., M.R.C.V.S. (Government Veterinary Officer of the Stock and Brands Department), says:—The foal may be put to a foster mother if available; otherwise choose the milk from a cow (one with a low fat test). Note: If foal has not suckled mother, give ½oz. castor oil and if necessary an enema 12 hours later. Dissolve 1 tablespoon of sugar in a little warm water and add 3-5 tablespoons of limewater and enough milk to make a pint. Warm this to blood heat and give ¼ of a pint every hour for the first few days, using a baby's feeding bottle with a large nipple. Then six (6) feeds daily of 1-1½ pints each feed. At 3-4 weeks old the sugar may be left out, but the limewater continued. Give four feeds daily of 1½ quarts per feed. In 5-6 weeks skim milk may be gradually substituted for whole milk and after 3 months the colt may be given all it can drink 3 times a day. Scrupulous cleanliness of utensils used for feeding must be observed, all vessels being rinsed out with cold water immediately after use and scalded subsequently. It is very advisable to provide a companion for an orphan foal reared by hand. Probably a young calf is best, although a quiet old ewe will serve instead. Supply oatmeal, crushed oats, bran and hay when it can nibble. If scouring, stop milk for 2-3 meals and give sweetened water and limewater and also 2-4 tablespoons of equal parts of castor oil and olive oil.

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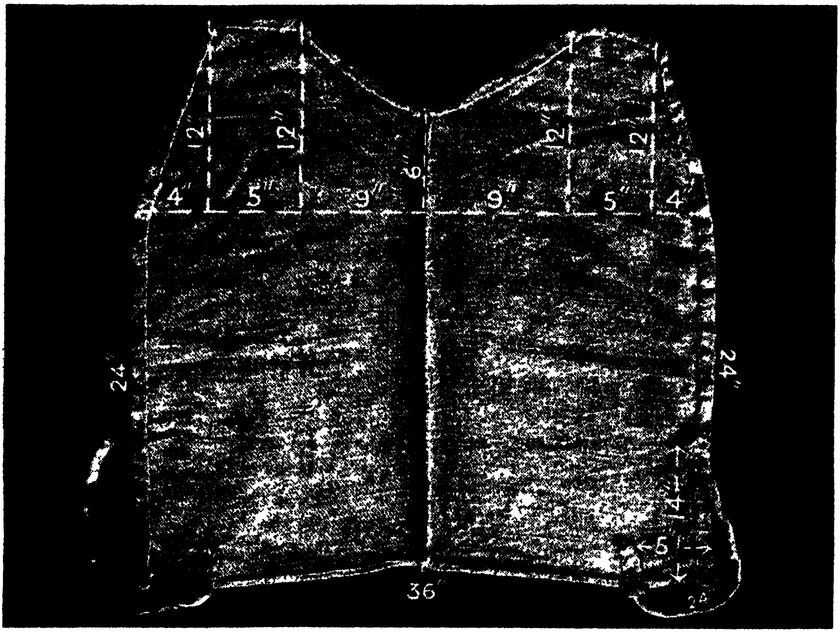
THE RUGGING OF SHEEP FOR WOOL IMPROVEMENT.

[By R. C. Scott, Supervisor of Experimental Work.]

In South Australia, upwards of 60,000 bales of inferior wool are offered for sale each year, and the chief causes of damage are dust and dirt. For such material there is very little demand, and the wool brokers are glad to clear it at almost any price which is offered. Naturally, this represents a very serious loss to the State, since 60,000 bales constitute from 25 per cent. to 30 per cent. of our total clip, and, assuming that the value is reduced by 50 per cent. compared with that which it would command if clean, the loss to producers is approximately £350,000 annually.



Rug made from a Used Cornsack, showing the dimensions required to fit a Merino Ewe of average size

In addition, it can be claimed that if less wool of this class was submitted at the Adelaide wool sales, the good name of these sales would be much improved, and more buyers encouraged to attend, a fact which would be to the advantage of sellers.

Anything that can be done, therefore, to prevent the introduction of dirt into the fleeces of South Australian sheep is of considerable importance, not only to owners themselves, but also to the State as a whole, since it will add to the general wealth of the community.

As 70 per cent. of our sheep are held within Goyder's line of rainfall, there are large numbers carried on farming areas where, at certain periods of the year, they run on fallow ground, resulting in the wool becoming impregnated with dirt.

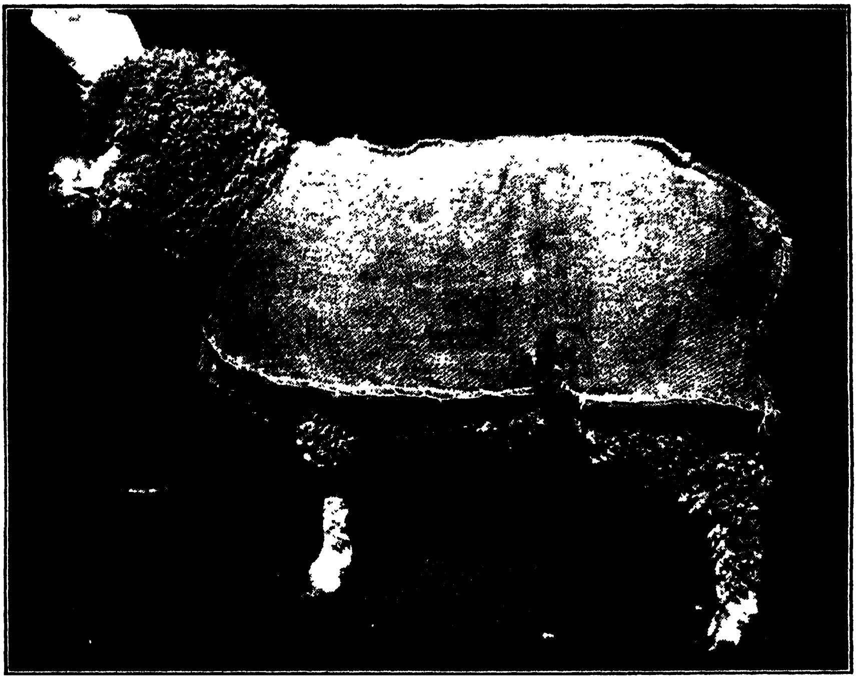
Further, there are many districts where the soil tends to drift; dust storms occur frequently, and the fleece, particularly that on the back of the animals, becomes heavily laden with sand. The wool loses its attractive appearance, is depreciated in value, and does not suit the requirements of our overseas buyers.

In an effort to keep the wool clean, and free from dirt, rugging has been resorted to, and whilst such method must be regarded as still being more or less in the experimental stages, the results obtained have been most encouraging, and allow the recommendation that sheep owners should test it out for themselves in the coming year.

Consequently, although it is not yet possible to submit definite conclusions, the following particulars indicate the origin of the idea, the method of rugging, and the results secured.

THE ORIGIN OF RUGGING.

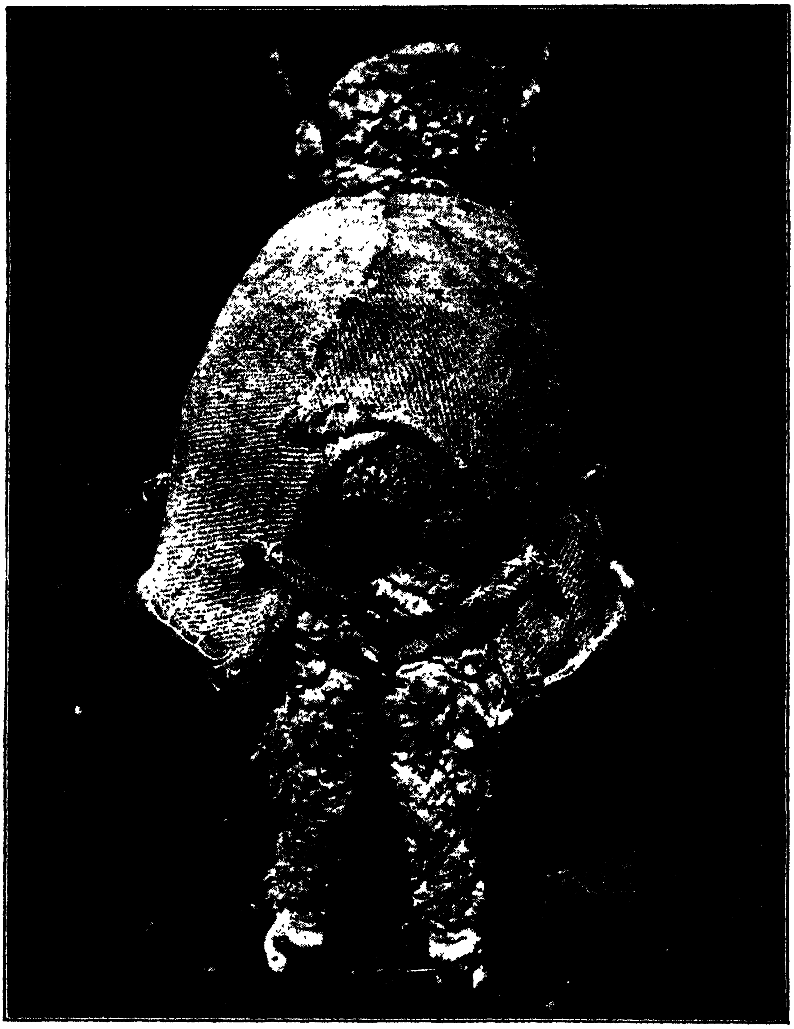
The credit for the idea of rugging sheep for wool improvement in farm flocks must be given to Mr. Spen. Williams, Manager of the Wool Department of Goldsbrough, Mort & Co., Ltd., in Adelaide. The fact that so much poor type farmer's wool was appearing at the Adelaide sales had been exercising Mr. Williams' mind for a long time, and when attention was drawn to the improvement in the wool of a decoy sheep at Port Adelaide, following rugging, he quickly realised the possibilities of the idea.



Rugged Sheep—Side View.

This decoy was a black-faced animal of no particular breed, held at Port Adelaide for use as a leader when trucking or shipping sheep. He ran in sandy stable yards, and, consequently, the fleece was practically valueless because of the sand and dust with which it was filled. However, on one occasion a light hessian bag rug was placed on the animal, and a remarkable improvement in the cleanliness of the wool resulted. Mr. Williams concluded that if such improvement could be effected with a sheep of this class, the subject of rugging was worthy of further investigation with animals of better type. Accordingly, a few sheep were rugged on the property of Mr. A. P. Anderson, of Halbury, in 1934, and about 70 Merino ewes treated at the Turretfield Seed Wheat Farm towards the middle of January of this year.

The idea is not new, as in the records of early Greek history instances are quoted of sheep being clothed in a covering of skin to defend the wool from filth, and protect it from being torn by hedges. Further, it has long been the practice to rug sheep for wool improvement in preparation for the show ring, but, so far as general sheep husbandry in Australia is concerned, it is the first time that rugging has been attempted as a regular procedure in the management of flocks.



Rugged Sheep—Back View, showing folding of rug over the tail, and the way the straps fit between the hind legs.

OBJECTS OF RUGGING.

As already stated, the primary object of rugging sheep is to protect the wool. This protection may be against either dirt, burrs, or excessive wetness, although, so far as the latter trouble is concerned, little information regarding the influence of rugging is as yet available. Dirt is the common cause of loss, and the wool on the back of the sheep is that which is mainly affected. Not only is this portion of the fleece depreciated because of the earthy material it contains, but also because the dirt prevents the free distribution of yolk, and, as a result, it becomes dry, harsh, and lacking in character.

In South Australia, Burr Medic, or Burr Clover, as it is more commonly called, grows strongly in many districts. The pods of this plant are toothed, and consequently attach themselves readily to the wool of sheep. Another plant, carrying seed with hooked spines, is the Bathurst Burr, and sheep running in country infested with this weed, or on land which, in the previous year, carried a good stand of Burr Clover, become so coated with the burrs of these plants as to reduce very much the value of the fleece.

Removal of Rug. The first step in the operation is to lift the hind leg, as illustrated, and slip the loop over the foot

In the higher rainfall areas the constant wetting during the winter months tends to lead to a wasting of the back wool, and it is possible that protection of some nature will prove of benefit.

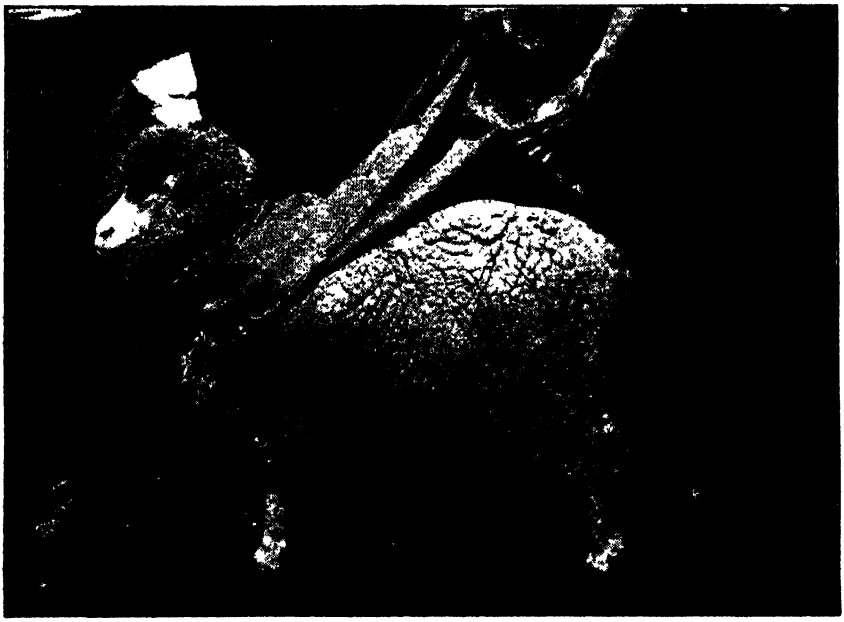
It was chiefly as a means of preventing the entrance of dirt and the clinging of burrs to the wool that rugging was considered, but, from other work done, it would appear that additional advantages from the method may be expected. These are associated with the fattening of lambs and store sheep, and the maintenance during the winter months of Merinos running in the colder, wetter districts of the State. In this connection there have been instances where rugged sheep have put on and maintained condition better than those which were unrugged.

It is possible, therefore, that, in the future, rugging will be adopted not only for improvement in wool, but also to assist in the topping up of fat stock for market, and maintaining animals in certain localities in a strong, healthy state.

THE RUGS.

The rugs may be manufactured from any sound material which will prevent the easy access of dirt, and, so far as wheat farmers are concerned, second-hand bags would probably be the cheapest. There are also other rugs on the market, made from light canvas, jute, &c., which are quite satisfactory; but for the present it is recommended that sheepowners should ascertain the position for themselves, at the minimum expense, by rugging portion at least of their flock with used bags.

On practically all farms bags are available which can be utilised without expense other than the labour of preparation, whilst, in the course of time, when the economic importance of rugging is realised, prepared rugs may be purchased. A good, sound bag should be chosen. This may be serviceable for a full year, but where sheep are constantly rubbing together, as in travelling or drafting, it is doubtful whether jute material will last for a whole season. However, since adjustments from time to time, as the wool grows, are necessary, this is not very important, as any rug showing signs of wear would be replaced with a sound article.



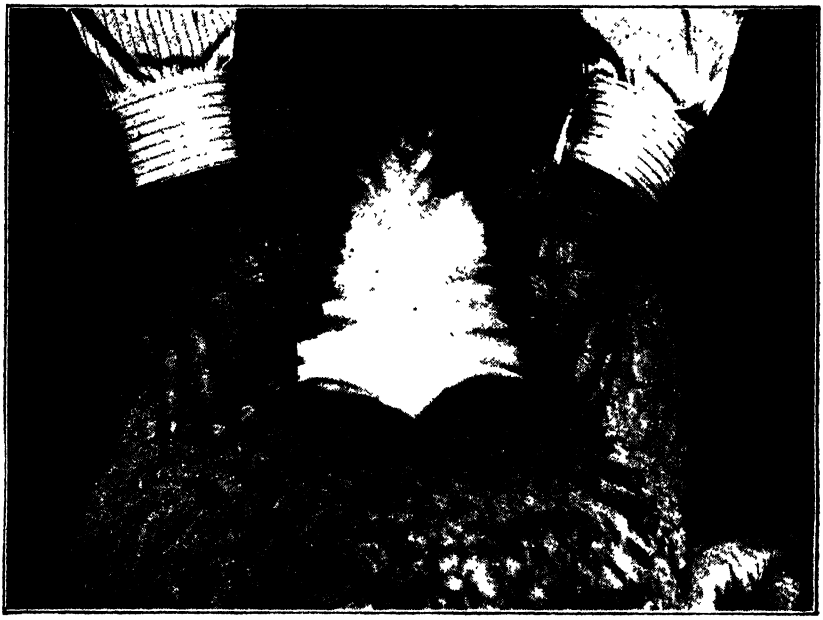
Second Operation in the Removal of the Rug, followed by slipping it over the other hind leg, and finally pulling the covering over the head of the sheep

The bag is cut as illustrated, and for an average-sized recently-shorn Merino ewe would measure about 33in. square overall, increasing to about 36in. for a larger animal.

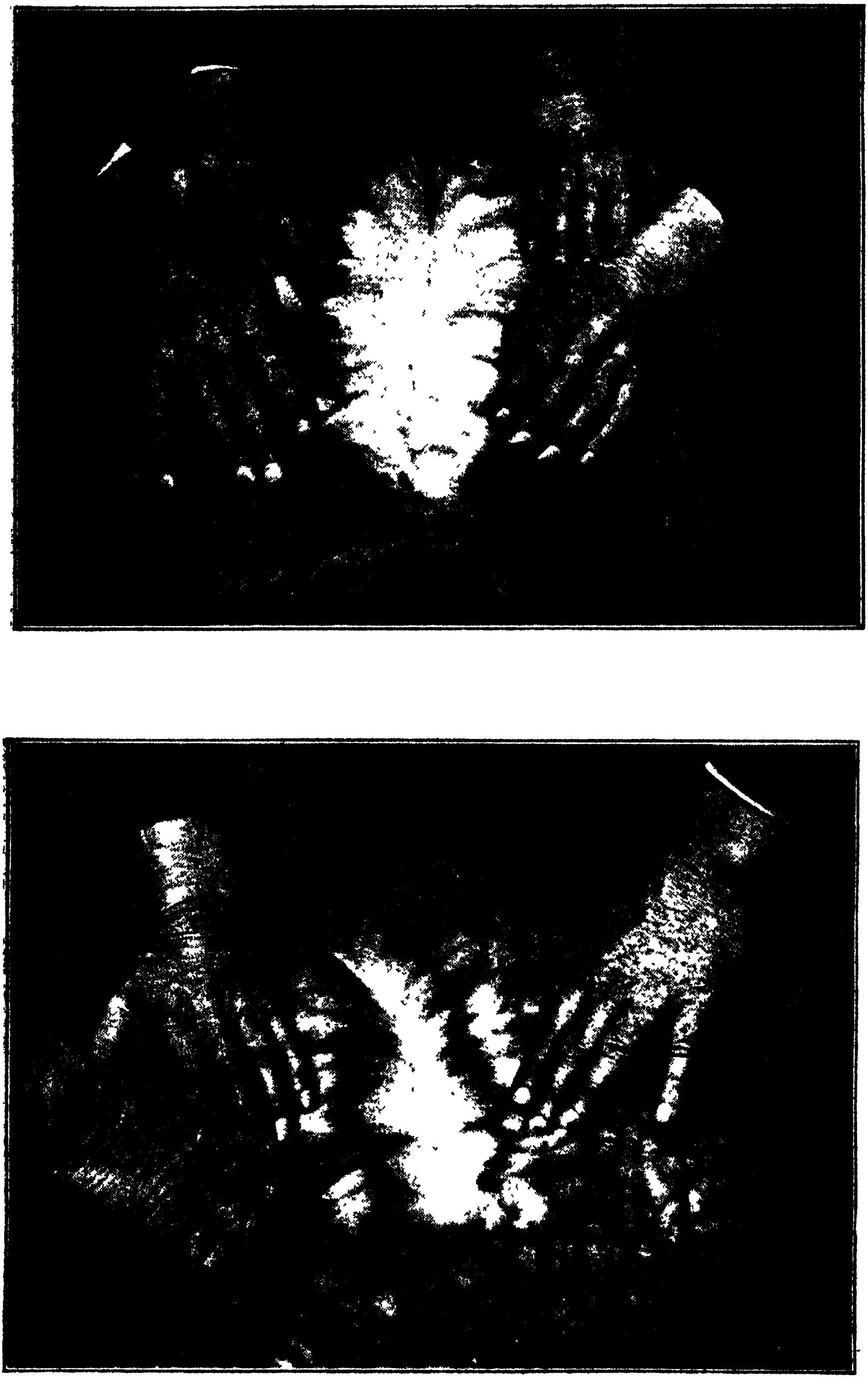
As the wool grows—say, in six months' time—a larger rug will be required, and that which suited a large ewe at shearing time would then be right for an average sheep.

Therefore, the dimensions of the rugs vary both according to the size of the sheep and the amount of wool growth, but overall measurements for Merino ewes are approximately as follows:—

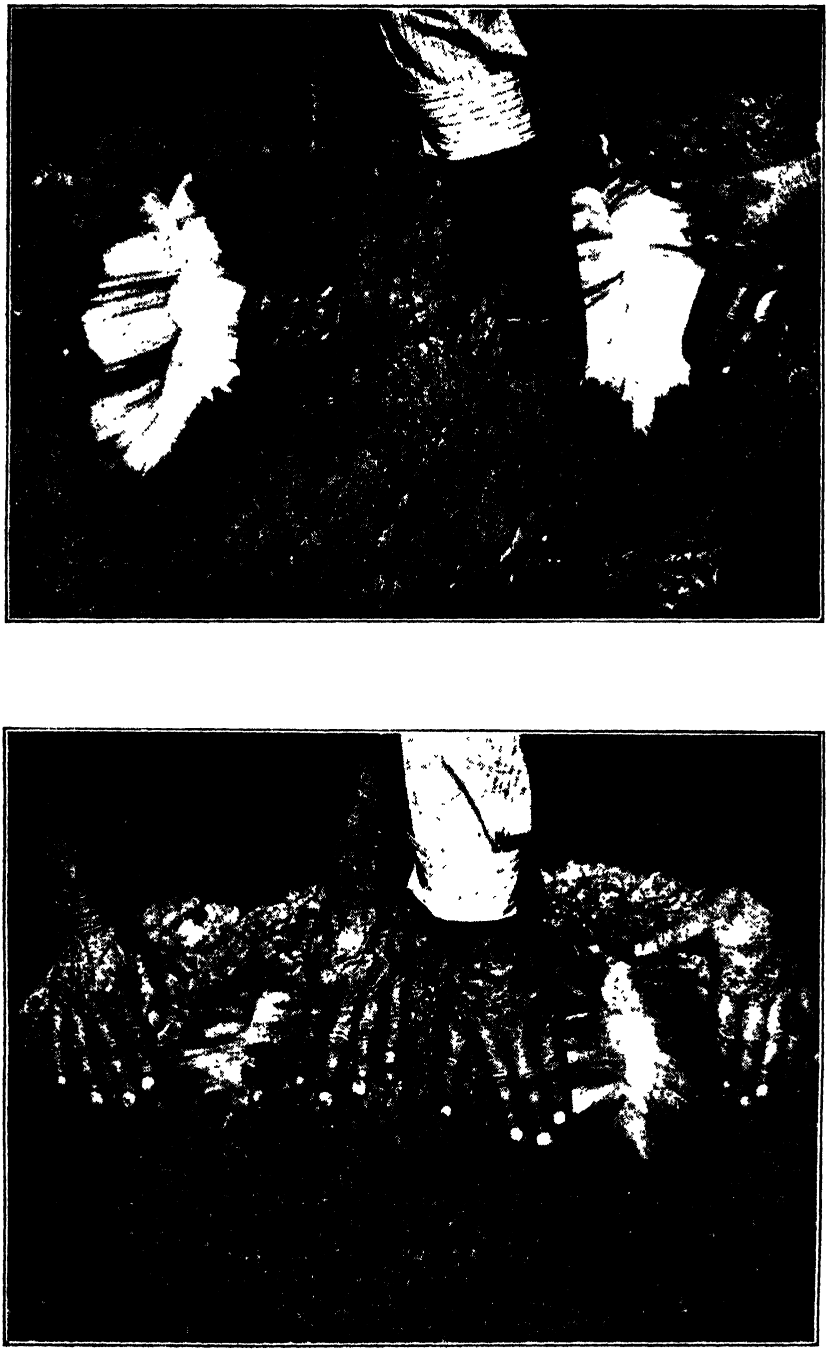
	At Shearing.	Six Months' Wool
Small ewe	30in. x 30in.	33in. x 33in.
Average ewe	33in. x 33in.	36in. x 36in.
Large ewe..	36in. x 36in.	39in. x 39in



Wool on the Back of a Rugged (upper) and Unrugged (lower) Sheep at Turretfield Note the edging of dirt in the wool of the Rugged animal, as this Ewe was not covered until approximately three months after shearing.



Wool on the Back of a Rugged (upper) and Unrugged (lower) Sheep at Halbury.



Wool on the Side of a Rugged (upper) and Unrugged (lower) Sheep at Turretfield.

The rug is shaped to fit around the chest, sloping back along the shoulder to the wither, and the distance from this point to over the tail is about 6in. less than the full measurement.

All edges must be hemmed, otherwise the material quickly frays out.

The straps that pass between the hind legs and are attached to the outside of the rug above the flank, may be made from folded bagging similar to those shown in the illustration, but probably it would be simpler and easier to use webbing. Each of the straps is about 2ft. in length, and about 1½in. in width. In some cases light rope is utilised, and is fairly satisfactory, but in our experience it is inclined to tear out at the eyelets.

THE FITTING AND ADJUSTMENT OF RUGS.

After the rug has been placed on the sheep, the first fixing is across the chest. Here the edges are drawn together until the pull on the neck and withers is comfortably firm. This may necessitate a certain amount of overlapping, or, on the other hand, the edges may not quite meet, when they would then be held together with a short length of rope or twine. However, it is important that the fitting across the chest, neck, and withers should be neat, as this assists in holding the rug in position.

The flank straps may be relatively slack, but should be attached fairly high up on the outside of the rug, when they help to make it fit closely to the body.

Most sheep droop, to a certain extent, over the tail, and to follow the shape of the back the bag should be folded at this point and sewn down. There is no need to cut any stitches to remove the rug, as, by simply lifting one hind leg, the flank loop may be slipped over the foot. The other leg can then be easily extracted, and finally the rug removed by pulling it over the head of the sheep.

As the wool grows some adjustment is necessary, but is not as frequent as would be at first thought. Probably three adjustments during the course of the year will be sufficient—say, after three, six, and nine months' wool growth.

A good deal of alteration can be effected by lengthening the joint at the chest, and letting out the flank straps, but when the limit in this direction is reached a change to a larger rug is necessary.

In the case of the biggest sheep, another rug will have to be placed upon them, but with the remainder much can be done by way of changing the covering from a larger to a smaller animal.

However, the actual labour of these adjustments is not particularly great, whilst the necessity for such attention may even be a distinct advantage, since it will compel some men to give greater attention to their flocks than they would otherwise, and, while fixing the rugs, will also crutch and carry out those operations necessary for maximum returns.

TIME OF RUGGING.

Shortly after dipping will probably be the best time for rugging, if danger from skin troubles is to be avoided, as the rugs would have to be removed prior to the animals entering the bath. As dipping usually occurs from three to four weeks after shearing, it would not be worth while fixing the rugs for this short period; but in areas where dipping is not compulsory they could be placed in position immediately the sheep are shorn.

Therefore, generally speaking, about a month after shearing would be rugging time, but whilst awaiting this operation the flock should be kept on moist or well-grassed land, avoiding the dusty fallows or drifting sand which would tend to foul the wool.

At one time it was thought that it would be sufficient if the rugs only remained in position throughout the dry period of the year—that is to say, until the new grass had formed a mat over the land, and danger from dirt was passed. However, whilst such treatment leads to considerable benefit, most advantage follows protection over the whole year. Immediately the rugs are removed burrs and seeds attach themselves to the wool, dust and dirt from yards and roads penetrate, whilst moist winter weather also causes depreciation of the fleece. This latter fact was illustrated at Turretfield this year, where some rugs were removed at the end of May, and in every case it was found that winter rains had affected the fleece. The period of rugging, therefore, is from dipping to shearing.

EXPERIMENTS IN SOUTH AUSTRALIA.

As pointed out in an earlier paragraph, the idea originated with Mr. Spen. Williams, and the first experiments were conducted on the property of Mr. A. P. Anderson, of Halbury, where there is free movement of sand, and in a normal season the wool becomes very dirty.

This year the work was continued at the Turretfield Farm, under the supervision of the Manager (Mr. F. E. Waddy), who has been responsible for improvements in the shape of rug recommended, and is an enthusiastic believer in the benefits to be gained by its adoption.

Following press paragraphs on the subject, very considerable interest has been aroused amongst sheepowners, and to-day there are probably some four to five thousand animals which have been provided with a protective coat. Consequently, in the very near future, results from a great number of tests conducted on a practicable basis will be available.

At the Turretfield Farm 70 Merino ewes were rugged on the 17th of January. This was about three months after shearing, and by that time a certain amount of dirt had penetrated the wool. The treated sheep ran with the remainder of the flock, and were handled in the normal way—that is to say, were turned in on the fallow land from time to time, hand-fed during the autumn, &c.

Because of the delay in rugging, there was some dirt present at the top of the staple, but the improvement in the quality of the wool was most marked.

The fleece was bright throughout, the back wool being almost equal to that on any other part of the body. The serrations were clearly defined, and each staple was square-tipped with sound wool right to the top, making a fleece which was full of yolk, soft and pleasant to handle.

When no protective covering had been applied dirt had entered the wool, especially on the back, where the fleece was fouled to the skin. Not only was the dirt mixed generally throughout the fibres, but it had also destroyed the character of the wool, making it harsh, trashy, and without life.

These objectionable features are not peculiar to sheep used in the experiment, but are general throughout the flocks carried in our agricultural areas and lands subject to drift, and, consequently, if they can be overcome, an enormous benefit to the State must result.

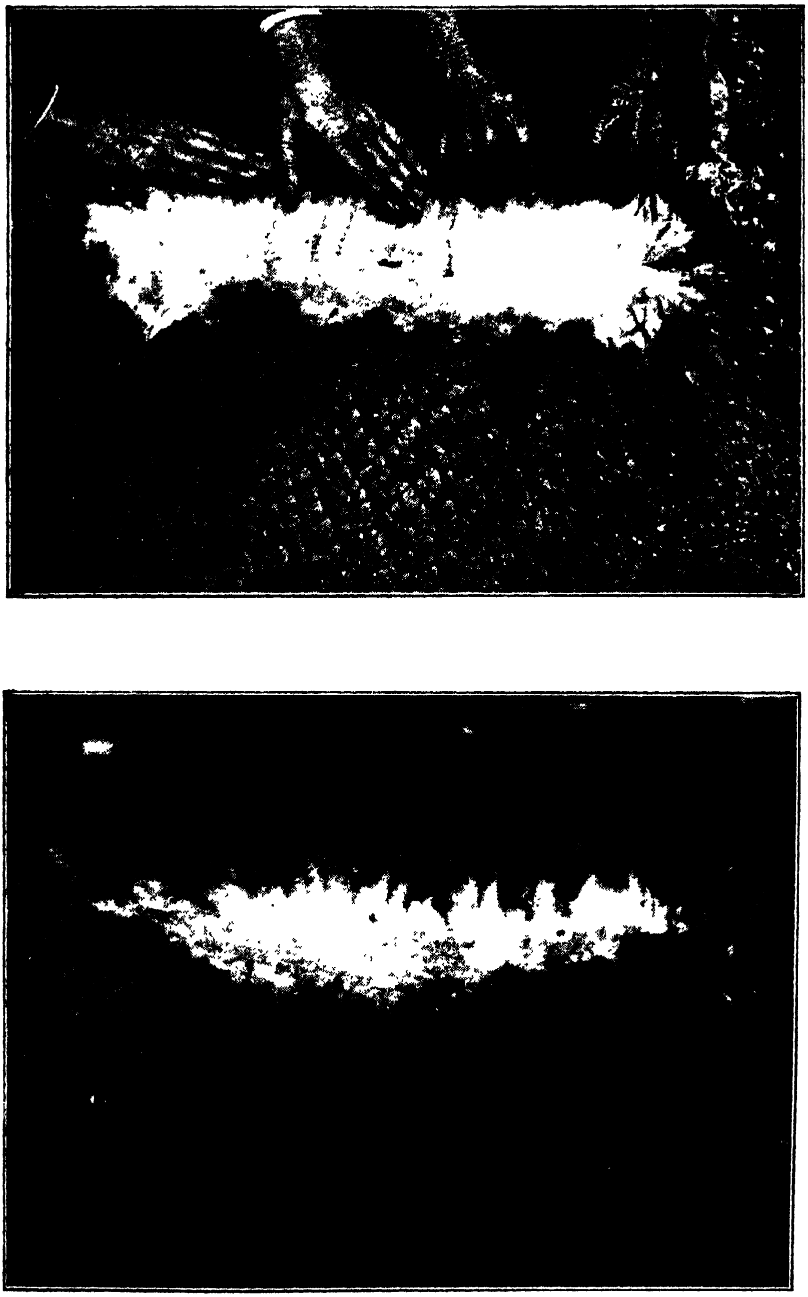
At Halbury the same differences occurred, although Mr. Anderson stated that the dust was not quite so bad this year, as, owing to the early opening of the season, the land became coated with grass sooner than is usually the case.

In addition to the improvement in the cleanliness and quality of the wool, there is also the matter of protecting the fleece from burr, which, apart from any other factor, would, if present, depreciate its value. Obviously, the wool from the rugged sheep was free of burr, and in consequence must command better prices. In fact, in some areas the presence of plants carrying burrs in the grazing area may be the main reason rendering rugging advisable.

The fleeces from the rugged ewes at Turretfield, together with a corresponding number from the unrugged sheep, were forwarded to Mr. Williams at Port Adelaide, who arranged for the skirting and classing of each line, so that a comparison could be made.

There were 50 fleeces in each division, as this represented the number of ewes which had carried the rugs continuously since the middle of January. The other 20 animals had either lost their rugs because of various fixings tested or on account of their removal in early winter to determine whether covering for the full year was required.

Wool on the Side of a Rugged (upper) and Unrugged (lower) Sheep at Halbury.



Side View of Wool on the Back of a Rugged (upper) and Unrugged (lower) Sheep at Turretfield.

The total weight from both lots was practically the same, being 578lbs. from the rugged and 579lbs. from the unrugged sheep. In the case of the former wool, however, there was a greater percentage of yolk present than there was in the latter, whilst, on the other hand, the extra amount of dirt in the unrugged fleeces made up for the lack of yolk, resulting in approximately equal weights.

On classing, the following lines were made:—

	Rugged Ewes. lbs.	Unrugged Ewes. lbs.
Fleece and good skirtings	542	537
Pieces	—	8
Bellies	36	34
	578	579

Therefore, except for the fact that the wool from the rugged sheep was cleaner, brighter, and of better quality generally, there was not much difference in the classing of the two lots. Eight pounds of burry and sandy pieces were separated from the unrugged wool, whilst none was obtained from the fleeces cut from the rugged sheep.

The most important consideration, however, is the value which each will command, and when offered at the Wool Sales held on the 14th November the rugged wool averaged 15.29d. per lb., and the unrugged 13.39d. per lb. There is, therefore, a difference of 1.90d. per lb. in favour of the rugged fleece, representing an increased wool value of approximately 2s. per sheep.

Further, it must be borne in mind that the experimental wool was partially damaged before the rugs were fixed in position, whilst, in addition, as much of the grazing area at Turretfield is well grassed permanent pasture land, the unprotected wool was cleaner than that which would be secured from average farm holdings in South Australia. This means that the benefit from rugging throughout the agricultural areas is not likely to be less than that quoted, but, generally speaking, and particularly when the wool is covered for the full year, it is almost sure to be greater.

As an example, at Halbury, where the rugs had been fitted for the whole season, heavier fleeces were cut from the rugged than the unrugged animals. This was due to the healthy condition of the wool and the full length of staple which carried yolk right to the tip. On the other hand, the wool from the unrugged sheep was dryer and harsher, with shorter staple, because the upper portion was of a fuzzy, trashy nature. The latter condition caused loss of weight, and the fleece wool from the rugged sheep averaged 14lbs. per head, as against 11lbs. from the unrugged animals.

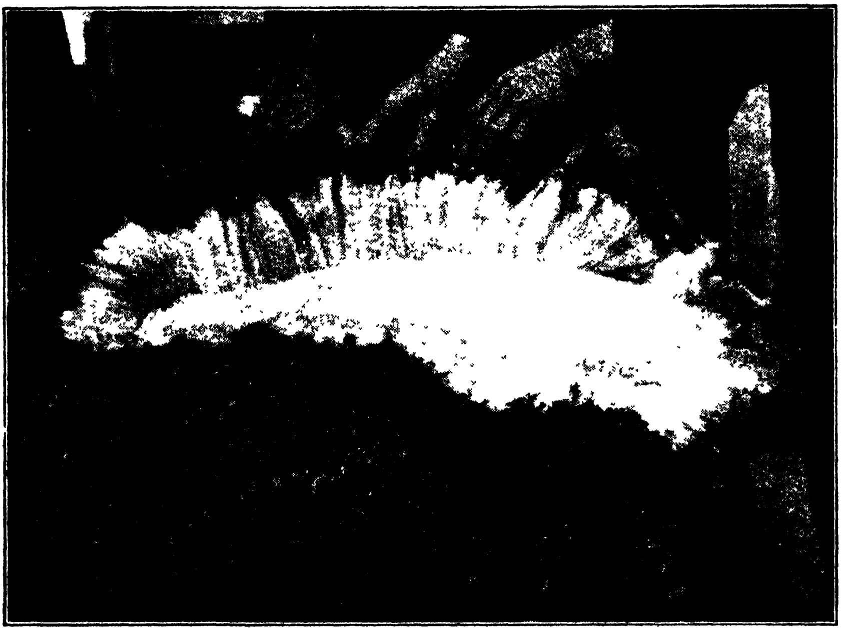
When submitted for sale on 14th November, the rugged fleece realised 17.1d. per lb. and the unrugged 14.5d. per lb. The additional cash return in this case amounted to 6s. 8d. per head, and represented quite an appreciable benefit from the method. At the same time, Halbury is a sandy district, and Mr. Anderson's sheep are well bred Merinos, with the result that in these circumstances such increase in the wool return may quite reasonably be anticipated.

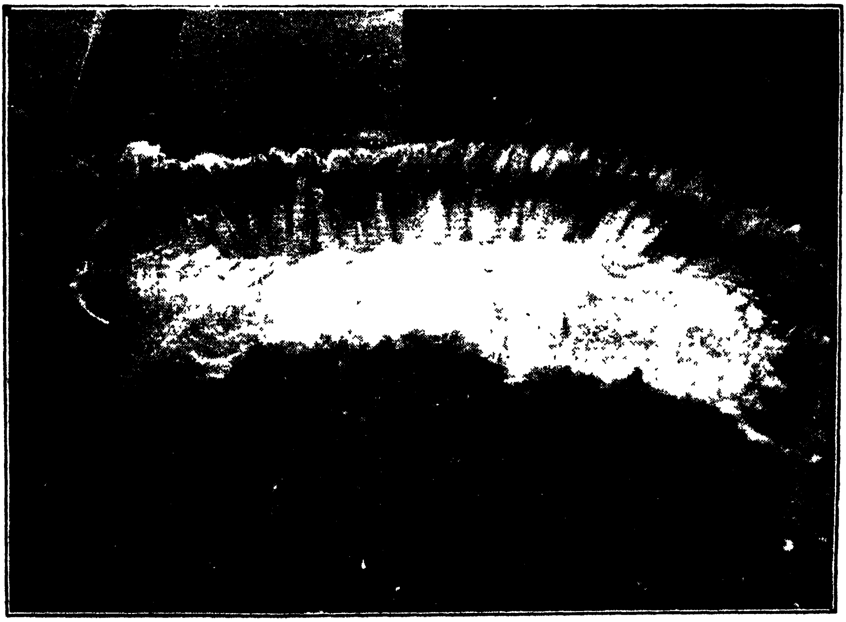
The results obtained, therefore, indicate that the method of protecting wool is economically sound, and, if adopted, will not only lead to financial gain by the sheep-owner, but also to the elimination of much poor quality wool which is more or less ignored by buyers at the Adelaide sales.

GENERAL DISCUSSION.

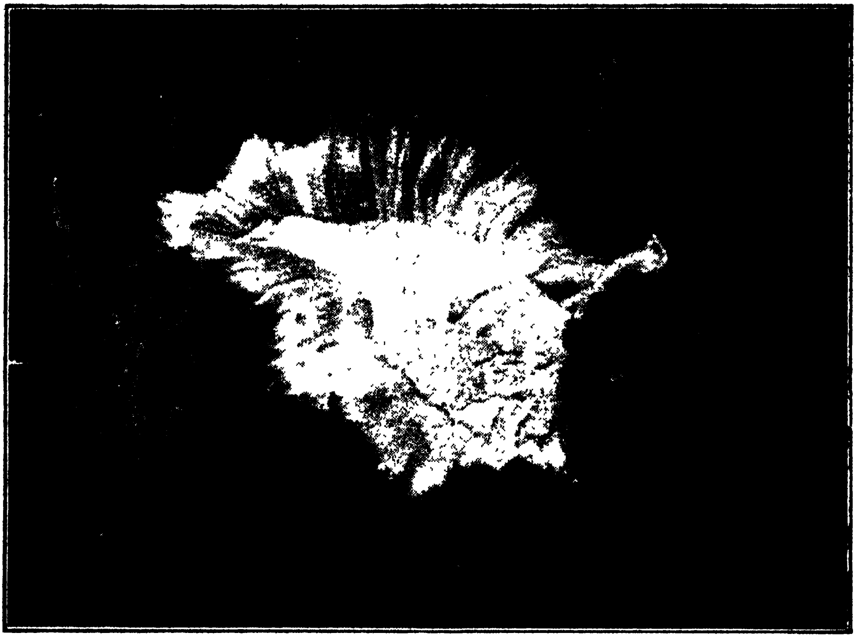
As yet, no disadvantages associated with the rugging of sheep have been discovered, and at the present time everything ascertained has been in favour of the scheme.

The rug does not cause any discomfort to a sheep, which quickly becomes accustomed to the feel of the bag on its back. For a few minutes after the rug is fixed into position the animal may rush about, but soon settles down. Since a sheep naturally evaporates moisture from the mouth, and not by sweating through





Side View of Wool on the Back of a Rugged (upper) and Unrugged (lower) Sheep at Halbury. The wool on the Rugged animal was soft and pliable, and would not stand erect without support, whereas that on the Unrugged Sheep was relatively harsh and needed no assistance in this connection



Wool on the Back of a Rugged (upper) and Unrugged (lower) Sheep at Halbury.

the pores of the skin, a rug does not affect the animal in this connection. As a matter of fact, a rugged sheep does not appear to feel the heat to the same extent as an unrugged animal, and if a hand is placed between the rug and the body on a hot day the back is cooler than that of a sheep which is directly subjected to the rays of the sun.

The grease from the wool renders the bag more or less waterproof, and although the fleece becomes damp in wet weather, it is not saturated nor subjected to washing conditions to the same extent as when unprotected.

Rugging makes no difference to the general management of the flock, and the ewes may be mated and allowed to lamb in exactly the same way as if unrugged. Those at Turretfield were travelled from field to field, run through the drafting race, yarded, &c., without any inconvenience whatsoever.

In the course of time, as the method of protecting the wool becomes successfully established, it is possible that jute rugs, already shaped and with selvedged edges, may be imported direct from India, but to-day there appears to be no serious objection to every sheepowner in the agricultural areas giving the idea a trial with second-hand bags, and this is the recommendation made.

SUMMARY.

1. The chief cause of damaged wool in South Australia is dirt.
2. There is little demand for dirty wool, and prevention of the entrance of dirt would lead to considerable financial gain.
3. The credit for the idea of rugging sheep to keep the fleece clean must be given to Mr. Spen Williams, Manager of the Wool Department for Goldsbrough, Mort Co., Ltd., in South Australia.
4. Records of early Greek history show that the Greeks protected the wool of their sheep with a covering of skin, but the above tests represent the first trial of rugging as a regular procedure in the management of flocks in South Australia.
5. The primary object of rugging is to protect the wool from filth and burrs.
6. It is possible that rugging may also improve the wool by protecting it from constant saturation in the winter.
7. Results obtained appear to indicate that rugged sheep lay on fat at a faster rate than those which are not rugged.
8. The rugs may be manufactured from any material which will prevent the easy access of dirt.
9. So far as wheat farmers are concerned, second-hand bags are probably the cheapest form of rug.
10. The bag is cut to shape, and the size will vary according to the sheep and the amount of wool growth.
11. Overall measurements for an average-sized recently-shorn Merino ewe are 33in. square, increasing to about 36in. square after six months' growth of wool.
12. Adjustment from time to time is necessary, and much can be done by lengthening the straps that pass between the hind legs, and also the attachment across the chest.
13. Shortly after dipping is recommended as the time for placing the rugs on the sheep.
14. Whilst the rugs may be removed in winter, when the land is coated with grass, it is preferable to allow the covering to remain in position until shearing time.
15. Very keen interest is being evinced in the possibilities of rugging, and some thousands of sheep have been rugged in the present season, with the result that conclusive evidence as to the economic value of the method will shortly be available.
16. Last year 50 Merino ewes at the Turretfield Farm, carried rugs continuously from 17th January until shearing time.
17. The improvement in the quality of the wool from the rugged ewes was most marked. It was clean, bright, soft to handle, and with the serrations clearly defined.

18. The weight of fleece from rugged and unrugged sheep was practically the same, but that from the former clean and full of yolk, whilst, in the case of the latter, it was soiled and dry on the back with the weight made by the dirt.

19. Except for the fact that the wool from the rugged ewes was cleaner and brighter, there was not much difference in the classing of the two lots.

20. The difference in price between the rugged and unrugged wool was 1.9d. per pound, representing approximately 2s. per head in favour of rugging.

21. The experimental wool was produced in clean country, and on the average the benefit from rugging is likely to be more than 2s. per head.

22. At Halbury, the benefit from rugging amounted to 6s. 8d. per head.

23. Protection of the wool by rugging is economically a sound proposition.

24. No disadvantages of rugging have yet been discovered.

25. Sheep are not distressed or inconvenienced by carrying a rug, even in very hot weather.

26. No variation in management is required because of the presence of rugs. Ewes may be mated, allowed to lamb, yarded, &c., without any special attention.

27. The rugging of farm sheep has everything in its favour, and a trial by all owners is strongly recommended.

28. Acknowledgment is made of the assistance rendered by Mr. S. Williams in supplying particulars of the treatment, and for classing and selling the experimental wool; to Mr. F. E. Waddy, Manager of the Turretfield Farm, for his enthusiastic assistance, designing the rug pattern, managing the experimental flock, and for much helpful criticism; and to Messrs. A. P. and L. Anderson, of Halbury, for permitting photographs of their rugged and unrugged sheep to be reproduced in this article.

ANALYSES OF ARSENATES OF LEAD.

Fourteen (14) samples were collected by a Departmental Inspector during August-September, and were analysed by the Department of Chemistry. The results of the analyses are given below, and for purposes of comparison, the guarantees, as declared by the manufacturers, are also shown.

	Brand.	Results of Analyses.					Guarantees.	
		Moisture.	Lead Oxide.	Calcium Oxide.	Total Arsenic Expressed as As_2O_5.	Water Soluble Arsenic Expressed as As_2O_3.	Total As_2O_5.	Water Soluble As_2O_3.
		%	%	%	%	%	%	%
1	" Aero " Powder	0·79	65·2	—	31·05	0·12	31·5	0·25
2	" Aero " Paste	47·31	34·5	—	16·65	0·06	15·75	0·13
3	Hemingway's Powder	0·86	64·7	—	32·4	0·18	32·0	·5
4	" Palmprest " Powder	0·35	64·6	—	32·2	0·12	31·5	0·25
5	" Vallo " Paste	47·61	35·05	—	16·2	0·09	*32·0	·5
6	" Vallo " Powder	0·55	64·9	—	31·8	0·15	32·0	·5
7	Berger's Powder	0·76	64·1	—	31·5	1·06	30·0	Nil
8	Berger's Paste	47·07	34·05	—	17·4	0·11	*30·0	Nil
9	Orchard Powder	0·19	64·9	—	32·9	0·18	30·0	·38
10	Orchard Powder (with astringent)	1·06	59·9	—	30·8	0·28	30·0	·77
11	† " Elephant " Powder	1·51	—	45·1	42·5	0·18	—	—
12	" Elephant " Powder (check sample)	0·46	63·8	—	32·7	0·43	32·0	·5
13	" Lune Vale " Powder	0·19	64·3	—	33·6	0·26	32·25	0·25
14	Cooper's Arsinette Powder (contains a spreader)	1·07	60·3	—	32·1	0·37	30·0	Nil

* Calculated on a dry basis. † Found upon analysis to be Calcium Arsenate.

Calculated on a moisture-free basis, the percentage contents and the suspension tests were as under:—

	Brand.	Lead Oxide.	Calcium Oxide.	Total Arsenic Expressed as As_2O_5.	Water Soluble Arsenic Expressed as As_2O_5.	Suspension Tests. Five Minutes.	Suspension Tests. Thirty Minutes.
		%	%	%	%	%	%
1	" Aero " Powder	65·7	—	31·3	0·12	68·5	32·5
2	" Aero " Paste	65·5	—	31·6	0·11	30·6	25·3
3	Hemingway's Powder...........	65·3		32·7	0·18	24·5	9·4
4	" Palmprest " Powder	64·8	—	32·3	0·12	23·0	8·5
5	" Vallo " Paste	66·9	—	31·0	0·17	13·4	7·3
6	" Vallo " Powder	65·3	—	32·0	0·15	57·1	30·3
7	Berger's Powder	64·6	—	31·7	1·07	32·0	20·1
8	Berger's Paste	64·3	—	32·9	0·21	84·1	73·1
9	Orchard Powder	65·0	—	33·0	0·18	29·2	27·0
10	Orchard Powder (with astringent)	60·5	—	31·1	0·28	84·4	32·7
11	* " Elephant " Powder	—	45·8	43·2	0·18	43·1	25·1
12	" Elephant " Powder (check sample)	64·1	—	32·9	0·43	82·0	53·4
13	" Lune Vale " Powder	64·4	—	33·7	0·26	44·9	10·6
14	Cooper's Arsinette Powder (contains a spreader)	61·0	—	32·5	0·37	81·6	66·9

* Calcium Arsenate.

In his comments on these samples the Analyst remarked:—''It will be noted that Sample No. 11, 'Elephant' Powder, is calcium arsenate, and not lead arsenate. From the suspension tests Berger's Paste (No. 8) appears to be in the finest state of subdivision, closely followed by Cooper's Arsinette (No. 14), 'Elephant' Powder (No. 12), and Orchard Powder (No. 10). Both Nos. 10 and 14, however, owe their high suspension values, in part, to spreaders.''

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1933

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk. Per Herd during Sept.	Milk. Per Cow during Sept.	Milk. Per Cow July to Sept.	Butterfat. Per Herd during Sept.	Butterfat. Per Cow during Sept.	Butterfat. Per Cow July to Sept.	Average Test.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	9	8	5,370	596·67	1,717·23	270·93	30·10	88·17	5·03
7/P .	29·57	26·67	20,850	705·35	1,836·46	958·76	32·44	87·88	4·57
7/TT	15·47	12·30	10,252	662·70	1,986·73	439·62	28 42	86·13	4·29
7/BBB	79·73	57·23	41,277	517·70	1,533·17	1,747·10	21·91	68·00	4·23
7/DDD	12	12	9,510	792·50	2,318·33	456·59	38·05	110·07	4·80
7/EEE	13	11·87	8,251	634·69	1.849·82	404 06	31·01	92·13	4·89
7/GGG	13	10·30	6,424½	494·19	1,206·26	299·92	23·07	58 25	4·67
7/HHH	12·37	8·83	7.562	611·30	976·29	242·10	19·57	32·34	3·20
7/III	19	8·97	9,969	524·68	1,199·33	350·29	18·44	42·27	3·51
7/KKK	25	20·23	18,598	743·92	1,709·39	859·27	34·37	81·17	4·62
7/MMM	12·77	9·60	6,803	532·73	1,461·26	336·48	26·35	77·08	4 95
7/NNN	16·43	13·67	11,368	691·81	2,041·55	510·71	31·09	89·95	4·49
7/OOO	22·83	16·30	11,260½	493·21	1,375·30	441 81	19·35	58·45	3·92
7/PPP	19·30	18·43	12,114½	627·67	1,665·12	532 94	27·61	78·99	4·40
7/QQQ	20·20	18	14,427½	714·23	1,992·94	637·68	31·57	90·74	4·42
7/RRR	21	16·90	13,332	634·85	1,509·84	610·44	29·07	67·29	4·58
7/SSS	9·80	8	6,875½	701·58	2,043·84	276·71	28·24	86·88	4·03
7/TTT	8	8	5,445	680·62	1,924·11	219·02	27·38	79·98	4·02
7/UUU	22	20·10	13,114	596·09	1,074·68	560·34	25·47	45·30	4 27
7/VVV	20·37	17·97	13,187½	647·35	1,194·58	584·82	28·71	52·80	4·43
Means	20·04	16·17	12,290·55	613·69	1,657·17	536·98	26·79	74·65	4·37

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Sept.	Per Cow during Sept.	Per Cow March to Sept.	Per Herd during Sept.	Per Cow during Sept.	Per Cow March to Sept.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	29·53	26·13	17,198½	582·46	2,988·52	829·80	28·10	153·05	4·83
9/C ..	15·40	13·93	10,695½	694·50	3,319·77	443·68	28·81	140·35	4·15
9/D ..	29·80	22·83	12,913	433·32	2,987·23	723·64	24·28	165·47	5·60
9/E ..	15	7·47	6,561	437·40	2,749·55	313·57	20·90	133·75	4·78
9/F ..	17·97	16·97	12,697½	706·58	3,293·06	598·58	33·31	148·12	4·71
9/G ..	30·20	19·10	18,055½	597·83	3,126·00	902·92	29·90	161·04	5·00
9/I ..	29·43	26·53	17,048½	579·28	2,963·60	709·70	24·11	127·47	4·16
9/J...	10	8·53	9,699	969·90	3,293·71	386·73	38·67	138·58	3·99
9/L ..	27	24·90	15,179	562·18	2,638·48	614·37	22·75	107·45	4·05
9/O ..	28·13	21·23	19,695½	700·12	3,038·81	895·98	31·85	142·11	4·55
9/P ..	45	43·97	34,946	777·03	3,047·73	1,924·65	42·90	158·31	4·40
9/T ..	16	10·63	9,763½	610·21	2,535·28	423·34	26·46	115·21	4·34
9/W .	28	20·03	16,874	602·64	4,005·35	785·45	28·05	172·95	4·65
9/X .	9·20	9·07	5,453	592·72	2,875·28	264·23	28·72	145·87	4·85
9/Y ..	9·77	9·03	5,824	596·11	3,207·78	232·75	23·82	129·90	4·00
9/Z ..	12	10·90	4,725	393·75	2,197·66	267·66	22·31	109·58	5·67
9/AA .	16·97	16·17	9,546	560·63	3,128·23	536·70	31·54	178·83	5·59
9/BB .	30·10	23·57	18,376½	620·18	2,297·37	866·13	29·19	116·66	4·74
9/CC .	17·10	17	10,920	638·51	3,571·66	585·08	34·21	186·38	5·36
9/EE .	43	36·80	16,095	374·30	1,634·59	704·00	16·37	80·42	4·37
9/FF .	12·57	10·17	4,923	391·64	1,292·30	171·85	13·67	46·90	3·49
9/DD	17	13·60	5,635½	331·50	1,459·09	245·09	14·42	71·89	4·35
Means	22·28	18·57	12,855·66	578·28	2,866·00	610·27	27·45	138·12	4·75

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Sept.	Per Cow during Sept.	Per Cow October to Sept.	Per Here during Sept.	Per Cow during Sept.	Per Cow October to Sept.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	36·03	36·03	31,631	870·62	6,715·76	1,582·19	43·53	350·37	5·01
5/D ..	32	31	23,898	746·82	5,800·88	1,206·32	37·70	308·51	5·09
5/E ..	34·23	24·57	18,086	528·39	5,688·90	964·98	28·19	295·74	5·31
5/R ..	70·60	64·47	50,358	713·38	5,640·95	2,317·27	32·83	254·23	4·58
5/EE .	18·30	16	14,372	785·35	5,393·58	666·06	36·40	269·74	4·63
5/Z ..	34	30·30	28,089	826·15	9,016·56	1,538·40	45·25	468·91	5·48
5/WW	20	17	13,230	661·50	5.873·55	631·43	31·57	276·76	4·77
5/XX	25	25	16,155	646·20	5,504·55	755·12	30·20	282·20	4·67
5/YY	11	10·43	7,287½	662·50	5,299·19	352·69	32·06	267·34	4·86
5/AAA	19	16·67	13,100	689·47	5,828·02	677·39	35·65	290·16	5·17
5/BBB	18·47	17·67	12,979½	702·73	4,264·94	689·29	37·32	216·17	5·31
5/DDD	28	26	30,180	1,077·85	9,491·96	1,182·49	42·23	392·30	3·92
5/EEE	26·90	22·43	15,786½	586·86	7,383·20	695·28	25·85	332·38	4·40
5/FFF	8	8	6,165	770·62	4,357·48	294·49	36·81	199·75	4·78
5/GGG	9	4·40	3,963	440·33	5,010·66	192·69	21·41	235·75	4·86
5/HHH	18	13·93	11,834½	657·47	6,677·87	500·48	27·80	271·90	4·23
5/III .	17	8·40	5,688	334·58	2,268·99	294·02	17·30	129·45	5·17
5/JJJ	27	27	20,220	748·89	4,384·50	1,162·46	43·05	236·58	5·75
5/KKK	20·80	17	7,815	375·72	3,727·34	362·18	17·41	125·35	4·63
5/AA .	21	19·43	13,623½	648·74	2,799·66	585·65	27·89	124·22	4·30
5/LLL	11·13	11·07	8,495	763·24	1,607·99	395·41	35·53	75·25	4·65
Means	24·07	21·28	16,807·45	698·29	6,297·25	811·73	33·72	305·09	4·83

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Sept.	Per Cow during Sept.	Per Cow December to Sept.	Per Herd during Sept.	Per cow during Sept.	Per Cow December to Sept.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	17·60	17·60	15,633	888·21	4,936·46	786·44	44·68	245·56	5·03
6/C .	22	18·20	18,607	845·75	5,227·26	829·94	37·72	225·68	4·46
6/Y .	18·60	5·73	3,282½	241·35	3,353·27	182·77	9·76	141·19	4·05
6/Ff .	29·90	20·37	17,484½	584·77	5,614·91	692·06	23·15	234·57	3·96
6/Kk	18	16·83	10.827½	572·46	4,466·98	382·30	21·20	175·90	3·78
7/Ll .	24·33	15·50	11,488	471·96	4,227·45	366·46	15·06	155·15	3·19
6/Oo .	25·97	18·87	17,763	683·95	5,852·30	681·39	26·24	249·30	3·84
6/Ss .	19·07	15·67	15,087	791·14	7,407·90	556·11	29·16	285·32	3·69
6/Tt .	25·13	20·10	17,863½	710·84	6,266·26	724·51	28·83	263·72	4·06
6/Vv	31·13	25·17	23,249	745·34	6,865·73	1,030·43	33·03	319·73	4·43
6/Xx	26·93	20·23	14,673	544·85	6,073·47	575·25	21·36	246·71	3·92
6/Ccc	24·23	13·57	10,479	432·35	3,961·76	418·53	17·27	172·53	3·99
6/Ddd	25	13·53	12,552	502·08	4,818·16	467·05	18·68	207·90	3·72
6/Jjj	25·47	17·60	14,786½	579·83	6,238·89	691·80	27·12	296·61	4·68
6/Mmm	8	7·37	4,942	617·75	6,744·37	231·85	28·98	306·82	4·69
6/Nnn	35·97	26·77	24,828	690·24	5,394·79	992·31	27·59	234·13	4·00
6/Ooo	27·03	24·43	22,973½	849·87	3,767·21	885·37	32·75	155·52	3·85
6/Ppp	22·33	21·80	19,452	832·00	3,642·41	721·28	30·72	145·51	3·71
6/Qqq	16	13·83	16,385	1,024·05	3,287·20	588·48	36·78	122·61	3·59
Means	23·04	17·53	15,360·58	666·80	5,692·55	618·65	26·86	242·45	4·08

METROPOLITAN AND EXPORT ABATTOIRS, ADELAIDE

MANUFACTURERS OF

Meat Meal for Pigs

Read Report of Trials made by Prof. Perkins, *Journal of Agriculture*, January and July, 1921.

Meat Meal for Poultry

For full information on above write to

The GENERAL MANAGER, Metropolitan and Export Abattoirs Board, Gepp's Cross, S.A.

ALSO MANUFACTURED—

BLOOD MANURE. BONE MANURE. BONE MEAL.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on 30th October, there being present:—Hon. A. L. McEwin, M.L.C. (Chairman), Messrs. R. H. Martin, A. J. Cooke, F. Coleman, P. J. Baily, H. N. Wicks, A. M. Dawkins, G. Jeffrey, J. W. Sandford, A. J. A. Koch, and H. C. Pritchard (Secretary). Apologies were received from Professor A. J. Perkins and Professor A. E. V. Richardson.

Mr. R. H. Eime's Paper on "Harness."—A copy of Mr. Eime's paper on "The Care of Farm Harness" had been submitted to His Excellency the Governor, who stated:—"I am very glad that Mr. Eime has written this article on the care of harness, and I am sure that it will be of great value to all those who are lovers of horses."

Life Members.—Life Membership of the Agricultural Bureau was conferred on Messrs. S. Shepherd (Kybybolite), P. R. Parker (Butler), J. McInerney, H. C. Mills, O. E. Longbottom (Riverton), and J. H. Vigar (Mount Hope).

New Branches.—Approval was given to the formation of Branches of the Agricultural Bureau at Myponga (Women's), Beetaloo Valley (Women's), Pinbong (Women's), and Hilltown (Men's), the following being enrolled as foundation members:—Myponga Women's—Mrs. L. Summers, Mrs. R. Magor, Mrs. M. Bounds, Mrs. E. L. Llewellyn, Mrs. L. Devison, Mrs S. Herring, Mrs. C. Martin, Mrs. E. Baxter, Mrs. E. Muller, Mrs. R. O. West, Mrs. L. Halliday, and Mrs. M. Brown. Pinbong Women's—Mrs. G. A. R. Scholz, Mrs. L. A. Scholz, Mrs. C. H. Scholz, Mrs. H. B. Scholz, Mrs. F .J. Rehm, Mrs W. Kempster, Mrs. F. Davies, Mrs. N. O. George, Mrs. J. Guidera, Mrs. E. G. Kammermann, Miss M. Kammermann, Miss J. Kammermann, Miss D. H. Rehm, Miss A. L. Rehm, Miss L. Helberg, Mrs. H. M. Johnson, Mrs. T. B. Bilske, Miss D. M. Scholz. Beetaloo Valley Women's—Mrs. P. Curtis, Mrs. J. Halse, Miss M. Ryan, Mrs. J. Arthur, Mrs. E. Pearce, Mrs. D. G. Boehm, Miss V. Pilkington, Miss F. Semmens, Mrs. E. Hardy, Miss Chandler, Miss N. Jones, Mrs. J. B. Giddings, Miss L. Giddings. Hilltown—S. Michael, L. J. Harvey, M. Somerville, R. E. Dinham, A. H. Wedding, J. T. McCarthy, H. L. Malcolm, W H. Coulter, M. Kimber, O. F. Petersen, W. J. Cornwall, J. Dee, H. H. Bulbeck, H. Michael, F. Bertelsmeier, L. S. Duckmanton, D. H. Cheetham, R. G. Williams, L. Richardson, D. S. Wyles, A. Miller, C. Maxwell, M. O'Halloran, O. Meyer, and R. Sluggett.

New Members.—The following names were added to the rolls of existing Branches:—Alawoona—R. C. Paull, G. A. Thomson, P. Masters, H. J. Blatchford; Auburn Women's—Mrs. C. Stephens, Mrs. A. Hean, Mrs. A. E. F. Kirkbright, Mrs. Chapman, Miss N. Schmerl; Balaklava—W. A. Tiller, Bruce Tiller; Balhannah—R. W. Miller, Claude Day, Angas S. Grivell, H. R. Hancock; Balumbah Women's—Mrs. Geo. F. Stubing; Barmera—L. H. Hoffmann, K. Hallam, H. Danvers, L. Saint, Mrs. Winterfield, Cornish, B. R. Cant, W. H. Lister; Berri—R. Lean, H. R. Tucker; Blackwood—H. W. Parsons, A. D. Magarey; Block E—R. Goddard, T. Hobscroft; Booleroo Centre—Cyril J. Carey; Boor's Plains Women's—Miss T. Reid, Miss L. Bignell, Miss M. Reid; Brimpton Lake—O. Green, J. W. Murch, A. Coffey; Buchanan—Harold Prior, Herbert A. Schulz, Ronald Waldhuter; Caliph—E. J. Marrett, W. Mudge; Carey's Gully—Cox, Dexel, H. Hart, B. Hart, Rex Jarrett, Dr. G. J. Stoney; Chapman Bore—K. Menadue, A. Menadue; Coonalpyn—A. F. Kiddle, R. A. Harley; Coonawarra Women's—Mrs. W. Drury, Miss Foster, Miss K. Teichelman, Mrs. S. Sharam, Mrs. F. Jackson, Miss F. Jackson, Mrs. A. Hoffman; Cungena—H. R. Patterson; Frayville—E. L. Jackson; Gawler River—J. E. Roediger, S. L. Dawkins, R. Baker; Buchanan—R. Rohde, A. G. Obst; Greenock—A. Nenke, A. H. Bockmann, T. W. Roennfeldt, S. G. Grossman; Green Patch—Bruce Ritchie, J. Altmann; Hanson—H. Rice, I. H. C. Neill, T. J. Canny; Kangarilla Women's—Mrs. H. Biddle, Mrs. O. Scott, Mrs. W. Dowling, Mrs. L. Osmond, Mrs. D. Roberts; Karte—B. W. Trowbridge, D. J. Small, A. M. Button; Karte Women's—

Miss O. Gum; Kelly—S. B. Castine; Ki Ki—C. Barton; Koolunga—Reg. Reid; Kybybolite Women's—Mrs. J. J. Johnson; Lipson—F. J. Provis; Mangalo Women's—Mrs. D. S. Schultz; McLaren Flat—K. Robertson, K. Warren, G. Ward; McLaren Flat Women's—Miss Elva Elliott, Miss G. Wickham; Millicent Women's—Mrs. W. Wiltshire; Monarto South Women's—Miss F. Lehmann; Mount Compass—Alex. J. Dowell, A. M. Gregory; Myponga—R. G. Magor; Narridy—P. H. Smart, P. D. Smith; Nunkeri—G. W. Ling; Owen—R. Wilson, A. Galbraith, G. Young; Parilla Well Women's—Miss A. F. Johnston, Miss D. J. Johnston, Miss D. Thiel, Miss V. Beckman; Penola Women's—Mrs. V. Roy, Miss Jessie Provis, Mrs. Marshall, Mrs. Tom Marks, Miss Audrey Marks, Mrs. J. Kenny, Miss Lucy Doman, Miss Heather Clifford, Mrs. F. W. Bethune; Penwortham—J. R. S. Hackett; Pinnaroo—H. J. Sheldon, R. L. McKenzie, Ron. Austin, F. W. Ross; Pinnaroo Women's—Miss I. Nicholls, Miss G. Nicholls, Mrs. C. Bowen, Mrs. Fischer; Port Elliott—W. Bennett, R. Anderson, L. Ifould; Pygery Women's—Miss E. Copley; Ramco—A. Modistach, V. Bishop; Redhill—James Sagar, John F. Pilkington; Rendelsham Women's—Miss Ida Campbell; Roberts and Verran—R. Pedler; Sandalwood—John B. Wilson; Scott's Bottom—Clifford Greeneklee, Robert Spangler; Sheoak Log Women's—Mrs. R. Shannahan, Mrs. J. C. Mitchell, Mrs. H. Koch, Mrs. H. K. Dridan; Snowtown Women's—Miss E. Cronin; Sutherlands—L. M. Schiller; Tantanoola—R. A. Mundy, A. C. Jordan, W. J. Beaton, L. Anness; Taplan—T. Schwerdt; Upper Wakefield—Murray Woods, Arnold Woods; Wandearah—T. Ryan, D. Kimberly; Warcowie—Richard Pumpa; Wasleys Women's—Miss G. Harding; Watervale—B. O. Sasche, N. Sasche, C. Schmerl, R. Ward, G. Garrard, L. J. Garrard; Whitwarta—E. L. Williams, A. E. Sires, F. P. Moebus; Wilkawatt Women's—Mrs. J. Bayley, Mrs. R. L. Zimmermann, Miss A. Crouch, Miss P. Gregurke, Miss D. M. Pritchard, Miss S. Good; Wilmington—E. Dignan; Yeelanna—G. G. Pearson, R. W. Pearson, W. G. Richardson, T. N. K. Richardson, H. Roediger; Yundi—J. A. Nicholson, A. T. V.

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IN COMMITTEE.

Port Lincoln Freezing Works (Wudinna Conference):—"That the Advisory Board send a circular to farmers in the Central Conference District asking them to endeavour to have export lambs ready by 1st September each year." Owing to the vagaries of seasons the Board would not make a recommendation, and the resolution was to be regarded as coming from the Wudinna Conference only.

Yard Fees (Congress Resolution):—"That this Congress ask the Advisory Board to approach the stock agents as a body and ask them to review the charges made for yard fees at country markets." The Secretary was instructed to ask the Stock Salesmen's Association to report on this resolution.

Tree Planting (Congress Resolution):—"That the Advisory Board of Agriculture recommend to Branches of the Agricultural Bureau that each May meeting be devoted to a discussion of the subject 'Tree Planting'." The Board decided to give effect to this resolution.

Soil Erosion (Congress Resolution):—"That Congress urges landholders to plant shade trees and stations and district council to conserve and plant trees on their territory to prevent duststorms and the erosion of the country." It was decided to send a copy of this resolution to Branches and to the Local Government Association.

St. John's Wort (Butler Conference):—"That the attention of the authorities in and around Port Lincoln be drawn to the spread of St. John's Wort, and they be asked to take steps to eradicate it." Resolution to be brought under the notice of the district council.

Appreciation (Taplan):—"That this Branch desires to express their thanks and appreciation to the Board of Agriculture for assistance rendered to the Branch during the past year in the way of visits from departmental officers, &c., to Branch meetings." Resolution received.

Conference Resolutions (Congress Resolution):—"That motions brought before district Conferences should be carried by a majority of delegates present before being passed on to the Advisory Board." The Board approved of this resolution, and decided that it would be brought into effect at all future Conferences.

Several items arising from Congress and conferences were taken in committee.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING MONTH OF SEPTEMBER, 1935.

IMPORTS.

Interstate.

Apples (bushels)	373	Bulbs (packages)	32
Bananas (bushesl)	14,928½	Cuttings, Fruit tree (package)	1
Citrus—Oranges (bushels)	2	Plants, Ornamental (packages)	73
Passion Fruit (bushels)	244	Roots, Grass (bags)	3
Paw Paws (bushels)	13	Seeds (packages)	61
Pineapples (bushels)	1,580	Shrubs (packages)	5
Nuts—		Trees, Fruit (packages)	30
Cocoanuts (bags)	130	Wine casks (No.)	3,904
Peanuts (bags)	1,787		
Peanut Kernels (bags)	85	*Fumigated*—	
Popple (bags)	2	Shrubs (packages)	3
Beans (bushels)	132	Trees, Fruit (packages)	12
Carrots (bags)	33	Wine casks (No.)	49
Cucumbers (bushels)	135		
Onions (bags)	26	*Rejected*—	
Potatoes (bags)	14,329	Bananas (bushels)	39
Potatoes, Sweet (bushels)	21	Pineapples (bushels)	3
Swedes (bags)	24	Beans (bushels)	3

Overseas.

(State Law.)

Wine casks (No.)	1,320	*Scalded*—Wine casks (No.)	120
Fumigated Wine casks (No.)	65		

Federal Quarantine Act.

	Packages.	Lbs.		Packages.	Lbs.
Seeds, &c.	2,025	303,029	Handles	288	—
Canes	243	—	Cocoanut chests	258	—
Tea chests	3,503	-	Timber	196,718	3,011,403

EXPORTS.

Federal Commerce Act.

		Packages.			Packages.
England	Citrus—Oranges	5	Netherlands, East	Citrus—Oranges	77
Fiji	Citrus—Oranges	8	Indies	*Vegetables	16
India	Apples	50	New Zealand	Citrus—Oranges	16,734
	*Vegetables	31		Seed, Clover	32
Malta	Citrus—			Trees, Fruit	1
	Grape Fruit	15	Singapore	*Vegetables	118
	Oranges	100			

* Potatoes excluded.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO. LIMITED reported on 1st November:—

BUTTER.—The congenial weather conditions throughout October resulted in production being well maintained, although the peak was reached during the second week. There has been very little diminution, however, so far, and the prospects for a maintenance of supplies are very satisfactory. Unfortunately, the London market, which had moved upwards sharply, eased rapidly, the troubled conditions in Europe no doubt being to a large extent responsible for these fluctuations. At the date of this report London values had eased to 105s. to 106s. per cwt. for choicest Australian butter. The peak price this season was 127s. per cwt. Butterfat payments to farmers, however, are still about 50 per cent. higher than they were last year, and local butter rates continue at:—Choicest creamery fresh butter in bulk, 1s. 3¼d. per lb. Prints and delivery extra. (This price is for local sale only and, under the quota system, the equalised price manufacturers will receive will be 13.3125d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines from 10½d. to 11½d. per lb. for choicest. Stores 6d. to 8d. per lb. (These prices are subject to equalisation levies.)

CHEESE.—This season has been a very prolific productive one for cheese, and record shipments have been sent forward to Britain from time to time. Latest reports indicate that the milk supplies to factories are keeping up well, and the season should be prolonged later than usual. Present London rates are 51s. to 52s. per cwt., and local values are:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. 1d. to 1s. 1½d. per lb.

EGGS.—The very stringent conditions imposed by the Commonwealth Export Department have resulted in less eggs being shipped than last year. Supplies to the floors have been about the same, but smaller proportions have been allowed by the graders to be exported, and only recently a further clause was imposed that no eggs which have been carried in chaff will be allowed to be shipped, even though the quality might be satisfactory. With the contracting of the export season values for farm eggs have eased:—Ordinary country eggs, fair average quality, 4½d. per doz net; long distance rail or shipping eggs, lower. Selected new laid, clean eggs, full sized, 10½d. to 11d. per doz. net.

BACON.—Sales have kept up well, the mild weather assisting in this regard, and during the month heavy quantities of hams were booked for the Christmas trade. Values have continued steady at:—Best quality sides, 9½d. to 9¾d. per lb.; middles, 9½d. to 10d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 1s. 2½d. to 1s. 3d.; cooked, 1s. 4½d. per lb. Lard, bulk, 5d. to 5½d.; prints, 6d. to 6½d. per lb.

ALMONDS.—Owing to there being an eager demand both locally and interstate, prices for almonds firmed during the month, and stocks were cleared readily from week to week. The quantities held by growers are now considerably depleted, and values are likely to be maintained at:—Softshells and Brandis, 9½d. to 10½d.; hardshells, 5¼d. to 5½d.; kernels, 1s. 10d. to 1s. 11d. per lb.

HONEY.—There was no improvement recorded in the demand for honey, although the quality of the consignments was quite satisfactory. Heavy stocks are still held by wholesalers, and the market continues depressed at:—Prime quality clear extracted, 2¼d. to 2¾d. per lb.; lower grades, 1d. to 2d. per lb.

BEESWAX.—Consignments of beeswax sold readily as received, and values were unchanged, being 1s. 3½d. to 1s. 4½d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms, which are in every way the best equipped in the State. The feature of the markets through October was the strong demand which resulted because of the shorter supplies. However, it is expected that this month there will be an improvement in quantities on account of the shortening of the egg season, and farmers will be quitting their fowls. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 4s. to 5s.; nice-conditioned cockerels, 3s. 4d. to 3s. 11d.; fair-conditioned cockerels, 2s. 6d. to 3s. 3d.; chickens, lower. Heavyweight hens, 2s. 8d. to 3s. 4d.; medium hens, 2s. to 2s. 7d; light hens, 1s. 7d. to 2s.; couple of pens of weedy sorts lower. Prime young muscovy drakes, 4s. 3d. to 5s. 6d.; young muscovy ducks, 2s. 8d. to 3s. 4d.; ordinary ducks, 1s. 3d. to 2s. 3d.; ducklings lower. Geese, 2s. 6d. to 4s.; goslings lower. Turkeys, good to prime condition, 8½d. to 10½d. per lb. live weight; turkeys, fair condition, 7d. to 8d. per lb. live weight; turkeys, poor and crooked breasted, lower. Pigeons, 6d. each.

POTATOES.—New season's, 13s. per cwt.

ONIONS.—New season's, 9s. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of October, 1935, also the average precipitation for October, and the average annual rainfall.

Station	For Oct., 1935.	Av'ge. for Oct.	To end Oct., 1935.	Av'ge. Annual Rainfall.
Far North and Upper North.				
Oodnadatta	0·85	0·43	3·90	4·66
Marree	0·63	0·47	4·01	5·88
Farina	1·03	0·50	4·06	6·43
Copley	0·41	0·48	2·94	7·87
Beltana	0·24	0·53	2·69	8·48
Blinman	0·68	0·77	3·77	11·86
Hookina	0·79	0·59	3·69	11·25
Hawker	1·03	0·79	5·10	12·26
Wilson	1·47	0·87	5·43	11·79
Gordon	1·44	0·77	4·96	10·53
Quorn	3·15	1·10	8·52	13·22
Port Augusta	1·96	0·84	8·07	9·44
Bruce	2·41	0·79	6·78	9·87
Hammond	2·42	0·95	7·26	11·21
Wilmington	2·42	1·47	10·74	17·32
Willowie	1·45	1·00	7·20	12·25
Melrose	3·05	2·00	18·13	22·88
Booleroo Centre	1·94	1·32	10·52	15·21
Port Germein	2·19	1·11	9·49	12·53
Wirrabara	2·83	1·66	14·60	19·29
Appila	2·17	1·29	12·34	14·65
Cradock	1·80	0·86	5·13	10·82
Carrieton	1·24	0·96	7·05	12·23
Johnburg	2·02	0·85	6·41	10·58
Eurelia	1·96	0·99	6·79	12·79
Orroroo	1·47	1·09	7·74	13·20
Nackara	1·77	0·72	6·73	11 09
Black Rock	1·24	1·01	7·01	12·37
Oodlawirra	1·35	0·67	6·06	11·68
Peterborough	1·41	1·12	8·33	13·22
Yongala	1·69	1·25	10·41	14·44
North-East.				
Yunta	2·46	0·68	5·93	8·55
Waukaringa	0·79	0·64	4·18	7·94
Mannahill	1·15	0·75	4·14	8·20
Cockburn	1·26	0·62	3·27	7·96
Broken Hill, N.S.W.	1·56	0·78	4·44	9·56
Lower North.				
Port Pirie	2·25	1·22	11·42	13·21
Port Broughton	2·59	1·20	13·52	13·88
Bute	2·48	1·35	13·29	15·44
Laura	2·67	1·70	14·89	17·95
Caltowie	2·34	1·53	11·71	16·74
Jamestown	2·81	1·60	13·25	17·69
Gladstone	3·07	1·55	14·17	16·29
Crystal Brook	3·34	1·49	15·43	15·78
Georgetown	2·55	1·65	13·76	18·37
Narridy	2·56	1·40	13·18	15·82
Redhill	2·45	1·46	16·04	16·59
Spalding	2·87	1·72	15·77	18·88
Gulnare	2·68	1·67	14·99	18·68
Yacka	2·44	1·33	13·99	15·39
Koolunga	2·45	1·38	12·94	15·38
Snowtown	2·08	1·37	14·25	15·74
Lower North—*continued*.				
Brinkworth	2·63	1·35	14·57	15·82
Blyth	1·93	1·47	16·06	16·78
Clare	4·07	2·12	22·31	24·51
Mintaro	2·33	2·08	19·90	23·42
Watervale	2·40	2·33	22·78	26·80
Auburn	2·13	2·16	20·46	23·98
Hoyleton	1·81	1·61	15·03	17·33
Balaklava	2·43	1·42	13·41	15·46
Port Wakefield	1·87	1·11	11·63	12·94
Terowie	2·00	1·17	8·86	13·35
Yarcowie	2·18	1·17	10·15	13·59
Hallett	2·57	1·46	14·52	16·46
Mount Bryan	2·67	1·35	15·96	16·83
Kooringa	3·32	1·67	15·26	17·85
Farrell's Flat	2·77	1·65	15·84	18·61
West of Murray Range.				
Manoora	2·51	1·77	16·70	18·92
Saddleworth	2·18	1·75	16·56	19·60
Marrabel	1·89	1·79	16·82	19·96
Riverton	2·36	1·88	19·62	20·81
Tarlee	2·51	1·65	15·66	18·10
Stockport	2·46	1·61	17·96	16·93
Hamley Bridge	3·02	1·48	15·57	16·54
Kapunda	2·69	1·83	16·03	19·79
Freeling	2·83	1·66	16·80	17·83
Greenock	3·41	1·98	19·87	21·53
Truro	1·98	1·83	17·69	19·89
Stockwell	2·45	1·81	17·96	20·13
Nuriootpa	2·41	1·85	21·78	20·72
Angaston	2·57	1·98	19·93	22·42
Tanunda	2·62	1·96	22·15	22·02
Lyndoch	2·72	2·14	22·29	23·40
Williamstown	2·16	2·37	22·73	27·77
Adelaide Plains.				
Owen	3·12	1·40	15·05	14·66
Mallala	1·94	1·50	12·82	16·56
Roseworthy	2·19	1·67	17·01	17·40
Gawler	2·50	1·73	17·31	18·91
Two Wells	2·03	1·40	17·94	15·75
Virginia	1·68	1·48	16·58	17·18
Smithfield	2·11	1·56	17·26	17·64
Salisbury	1·46	1·58	16·66	18·56
Adelaide	2·63	1·72	21·38	21·15
Glen Osmond	2·50	2·13	24·18	26·05
Magill	2·29	1·97	23·41	25·53
Mount Lofty Ranges.				
Teatree Gully	2·13	2·14	23·85	27·20
Stirling West	3·96	3·73	47·61	47·08
Uraidla	2·50	3·34	37·44	44·19
Clarendon	2·79	2·61	32·30	23·88
Happy Val'y Res.	2·48	—	24·39	—
Morphett Vale	2·63	1·84	22·01	22·66
Noarlunga	2·61	1·60	20·09	20·37
Willunga	2·53	2·14	23·38	26·02
Aldinga	2·69	1·56	18·73	20·27

RAINFALL—*continued*.

Station.	For Oct., 1935.	Av'ge. for Oct.	To end Oct., 1935.	Av'ge. Annual Rainfall.
MOUNT LOFTY RANGES—*continued*.				
Myponga	3·47	2·18	34·21	29·50
Inman Valley	3·94	—	31·27	—
Yankalilla	2·65	1·68	21·24	22·83
Mount Compass	3·58	—	—	—
Mount Pleasant	1·89	2·38	23·67	27·23
Birdwood	1·99	2·48	25·57	29·21
Gumeracha	2·12	2·82	29·60	33·41
Millbrook Res.	2·24	2·86	33·24	34·68
Tweedvale	2·38	2·98	35·56	35·99
Woodside	2·47	2·71	31·07	32·31
Ambleside	2·68	2·98	35·42	34·90
Nairne	2·47	2·43	27·48	28·22
Mount Barker	2·78	2·74	30·00	31·31
Echunga	2·95	2·83	34·46	33·30
Macclesfield	2·79	2·62	29·77	30·43
Meadows	2·77	3·04	34·37	36·16
Strathalbyn	3·06	1·72	20·45	19·31
MURRAY FLATS AND VALLEY				
Meningie	1·77	1·46	16·14	18·37
Milang	1·32	1·31	11·55	14·91
Langhorne's Ck.	1·93	1·37	13·92	14·87
Wellington	1·96	1·36	13·63	14·65
Tailem Bend	1·97	1·46	14·27	15·06
Murray Bridge	1·67	1·28	11·25	13·56
Callington	1·94	1·34	12·99	15·19
Mannum	1·74	1·03	11·15	11·49
Palmer	1·96	1·45	15·54	15·63
Sedan	1·48	1·13	9·01	12·11
Swan Reach	1·02	0·99	8·64	10·64
Blanchetown	1·48	1·07	7·54	11·01
Eudunda	1·60	1·54	15·01	17·17
Pt. Pass	1·85	1·48	15·17	—
Sutherlands	1·13	0·99	6·61	10·84
Morgan	1·30	0·91	5·83	9·17
Waikerie	1·21	0·92	6·88	9·65
Overland Corner	1·11	0·95	5·02	10·32
Loxton	1·03	1·03	6·65	11·54
Berri	0·98	0·92	7·08	10·17
Renmark	1·04	1·07	7·43	10·41
WEST OF SPENCER'S GULF				
Eucla	2·59	0·69	13·18	9·96
Nullarbor	1·79	0·59	13·45	8·81
Fowler's Bay	1·35	0·83	11·62	11·94
Penong	1·92	0·83	12·64	12·27
Koonibba	1·79	0·99	12·63	12·13
Denial Bay	1·99	0·89	11·13	11·36
Ceduna	2·15	0·82	12·41	10·16
Smoky Bay	1·42	0·75	11·07	10·53
Wirrulla	1·35	0·94	13·84	10·54
Streaky Bay	1·53	0·97	17·78	14·88
Chandada	1·33	0·84	13·35	—
Minnipa	2·81	1·15	14·03	14·96
Kyancutta	3·79	1·04	15·52	—
Talia	1·51	0·97	14·26	14·76
Port Elliston	1·55	1·16	16·70	16·54
Lock	3·06	1·17	16·59	16·52
Mount Hope	1·12	—	19·53	—
Yeelanna	1·51	1·27	18·67	15·94
Cummins	1·50	1·34	18·95	17·60
Port Lincoln	2·25	1·37	16·02	19·42
Tumby	2·48	1·25	13·66	14·12
Ungarra	2·82	1·45	17·12	16·85
Port Neill	3·44	1·25	13·23	13·09
WEST OF SPENCER'S GULF—*continued*.				
Arno Bay	3·56	1·18	14·30	12·65
Rudall	2·27	0·99	14·19	12·64
Cleve	3·15	1·31	17·38	14·83
Cowell	2·35	1·11	9·43	11·07
Miltalie	2·27	1·30	14·43	13·67
Mangalo	1·91	1·23	12·24	13·91
Darke's Peak	2·17	1·25	16·63	15·18
Kimba	2·51	0·96	12·90	11·82
YORKE PENINSULA.				
Wallaroo	1·89	1·16	12·56	13·98
Kadina	1·68	1·29	14·13	15·64
Moonta	1·71	1·22	12·67	15·06
Paskeville	1·64	1·37	12·98	15·49
Maitland	2·41	1·60	18·93	19·90
Ardrossan	1·72	1·23	13·33	13·97
Port Victoria	2·75	1·26	12·94	15·44
Curramulka	3·78	1·61	15·92	17·87
Minlaton	2·94	1·48	15·20	17·79
Port Vincent	2·29	1·25	12·76	14·43
Brentwood	3·00	1·36	16·39	15·55
Stansbury	2·51	1·46	15·60	16·82
Warooka	2·45	1·35	15·74	17·49
Yorketown	2·08	1·33	18·61	16·88
Edithburgh	1·95	1·30	15·61	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	1·51	1·56	27·18	24·82
Kingscote	3·95	1·38	23·00	19·14
Penneshaw	3·54	1·40	21·33	18·92
Victor Harbour	2·93	1·80	20·34	21·37
Port Elliot	2·83	1·64	16·81	19·93
Goolwa	2·62	1·46	15·05	17·85
Maggea	1·02	0·96	7·71	10·04
Copeville	0·95	1·14	10·06	11·51
Claypans	1·21	1·11	10·15	10·38
Meribah	0·74	1·03	7·88	11·31
Alawoona	0·83	0·92	8·26	10·36
Caliph	0·83	1·67	7·28	—
Mindarie	1·09	1·28	9·40	12·21
Sandalwood	1·42	1·31	11·72	13·66
Karoonda	1·88	1·41	13·22	14·36
Pinnaroo	1·34	1·29	8·48	14·43
Parilla	1·40	1·28	10·55	13·82
Lameroo	1·52	1·51	11·61	15·97
Parrakie	1·32	1·43	14·87	14·62
Geranium	1·10	1·54	15·48	16·51
Peake	2·03	1·54	16·29	16·01
Cooke's Plains	1·49	1·44	14·16	15·30
Coomandook	1·69	1·62	15·28	17·09
Coonalpyn	3·05	1·63	18·42	17·61
Tintinara	3·12	1·61	19·09	18·71
Keith	1·52	1·54	17·68	17·92
Bordertown	0·85	1·77	16·82	19·21
Wolseley	0·95	1·82	16·41	18·49
Frances	0·89	1·98	20·39	20·11
Naracoorte	1·07	2·04	22·31	22·66
Penola	1·04	2·31	22·14	26·01
Lucindale	1·38	1·96	26·31	23·34
Kingston	1·32	1·76	22·39	24·28
Robe	1·28	1·71	23·32	24·67
Beachport	1·31	1·79	25·89	27·09
Millicent	1·80	2·23	31·45	29·79
Kalangadoo	1·32	2·82	26·43	32·28
Mount Gambier	2·14	2·46	25·39	30·45

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Dec.	Jan.
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	565	5	3
Alma	565	—	—
Angaston	*	—	—
Appila-Yarrowie	formal	6	3
Arthurton	565	—	—
Ashbourne	566	4	8
Auburn Women's	575	R	31
Balaklava	*	R	R
Balhannah	*	—	—
Balhannah Women's	*	18	—
Balumbah	*	—	—
Balumbah Women's	575	4	R
Barmera	*	—	—
Barootа	565	9	18
Beetaloo Valley	*	9	6
Beetaloo Valley Women's	576	—	R
Belalie Women's	576	10	14
Belvidere	*	—	—
Berri	566	9	6
Blackheath	566	12	9
Black Rock	*	—	—
Black Springs	*	R	R
Blackwood	*	9	13
Block E	*	—	—
Blyth	565	27	24
Booborowie	*	9	6
Booleroo Centre	565	R	R
Boolgun	*	—	—
Boor's Plains	566	—	—
Boor's Plains Women's	576	—	R
Brentwood	566	2	6
Brimpton Lake	566	—	—
Brinkley	563	4	8
Brownlow	*	—	R
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	19	16
Butler	*	—	—
Calca	*	—	—
Caliph	*	3	7
Carey's Gully	*	—	—
Chandada	*	—	—
Chapman's Bore	566	9	R
Charra	*	—	—
Cherry Gardens	566	14	—
Chilpuddie Rock	*	4	—
Clare Women's	575	7	4
Clarendon	*	9	6
Collie	*	4	—
Coomandook	566	27	R
Coonalpyn	*	4	—
Coonalpyn Women's	*	—	—
Coonawarra	*	12	9
Coonawarra Women's	576	19	R
Cummins	*	13	R
Cungena	*	5	2
Currency Creek	*	9	13
Dudley	*	—	—
Echunga	*	R	R
Eurelia	*	14	11
Eurelia Women's	*	4	—
Finniss	*	—	—
Frances	*	—	—
Frayville	*	—	R
Gawler River	*	—	—
Georgetown Women's	576	10	14
Gladstone	*	6	8
Gladstone Women's	575	17	21
Goode	566	—	R
Goode Women's	*	—	—
Green Patch	566	5	9
Greenock	565	16	20
Gumeracha	*	9	13
Hanson	565	10	7
Hartley	566	4	8
Hilltown	565	3	7
Hindmarsh Island	*	—	—
Hope Forest	566	2	6
Hope Forest Women's	*	—	—
Inman Valley	566	19	16
Jamestown	565	18	15
Jervois	*	12	9
Kalangadoo	*	14	11
Kalangadoo Women's	—	14	11
Kangarilla Women's	576	19	16
Kanni	*	—	—
Karte	566	—	—
Karte Women's	576	—	—
Kelly	H. O.	7	R
Ki Ki	*	—	—
Kilkerran	*	5	9
Koolunga	*	—	—
Koonunga	565	—	—
Koppio	566	11	8
Kulkawirra	*	10	4
Kyancutta	*	8	7
Kybybolite	*	5	9
Kybybolite Women's	576	10	—
Lameroo	566	7	4
Laura	*	7	11
Laura Bay	566	10	14
Laura Bay Women's	576	10	10
Lenswood and Forest Range	*	—	—
Light's Pass	565	—	—
Lipson	*	7	4
Lone Gum and Monash	565	19	16
Lone Pine	formal	9	6
Longwood	566	—	—
Lyndoch	*	10	7
MacGillivray	*	10	7
McLaren Flat	*	—	—
McLaren Flat Women's	*	5	2
Maltee	566	5	9
Maltee Women's	576	—	—
Mangalo	*	—	—
Mangalo Women's	576	11	8
Marama	*	—	—
Milang	566	R	R
Millicent	*	27	24
Millicent Women's	575	—	R
Miltalie	566	7	R
Minnipa	*	—	—
Monarto South	566	—	—
Monarto South Women's	576	21	18
Moorlands	*	11	18
Moorook	*	—	—
Morchard	*	6	8
Morchard Women's	576	—	22
Mount Barker	*	16	20
Mount Bryan	*	—	—
Mount Compass	*	—	—
Mount Gambier	565	13	10
Mount Hope	560	10	7
Mount Pleasant	*	4	8
Mudamuckla	*	14	11
Mudamuckla Women's	575	—	—

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Branch.	Report on Page.	Dates of Meetings.	
		Dec.	Jan.
Mundalla	565	—	—
Mundalla Women's	576	12	9
Murray Bridge	*	—	—
Murraytown	564	—	—
Mypolonga	*	—	—
Myponga	*	19	16
Myponga Women's	576	12	16
Nantawarra	—	5	9
Narridy	565	—	R
Narridy Women's	575	—	—
Narrung	*	—	—
Nelshaby	—	—	—
Nelshaby Women's	—	—	—
Nunjikompita	formal	5	9
Nunkeri	*	5	9
O'Loughlin	*	9	13
O'Loughlin Women's	576	—	—
Owen	565	9	13
Palabie	*	—	—
Parilla	*	17	21
Parilla Women's	*	18	15
Parilla Well	*	9	6
Parilla Well Women's	—	31	28
Parrakie	*	—	—
Parrakie Women's	576	31	28
Paskeville	566	10	7
Penola	565	7	4
Penola Women's	575	—	—
Penwortham	565	4	8
Petina	*	28	25
Pinbong	566	—	—
Pinbong Women's	*	—	—
Pinkawillinnie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	576	6	10
Port Elliot	*	—	—
Pygery	566	10	7
Pygery Women's	*	17	14
Ramco	563	9	6
Redhill	565	R	R
Rendelsham	*	7	4
Rendelsham Women's	575	—	—
Renmark	*	—	—
Riverton	*	9	13
Roberts and Verran	*	—	—
Rosedale	565	—	—
Roseworthy	*	—	—
Saddleworth	*	6	10
Saddleworth Women's	572	3	7
Scott's Bottom	566	7	4
Sheoak Log Women's	575	—	R
Shoal Bay	*	10	7
Snowtown	*	13	10
Snowtown Women's	575	5	2
South Kilkerran	—	2	R
Springton	*	4	—
Stanley Flat	*	16	20
Stockport	565	—	—
Strathalbyn	*	11	8
Sutherlands	565	—	R
Tantanoola	565	7	4
Tantanoola Women's	575	4	—
Taplan	*	3	R
Taplan Women's	*	—	—
Taragoro	*	5	9
Tarlee	*	—	—
Tatiara	*	—	—
Tintinara	*	—	—
Truro	565	R	R
Tweedvale	566	19	16
Tweedvale Women's	*	16	20
Ungarra	*	—	—
Upper Wakefield	*	—	—
Wallala	*	11	8
Wandearah	565	10	7
Warcowie	565	10	7
Warcowie Women's	576	—	—
Warramboo	566	10	R
Warramboo Women's	*	—	—
Wasleys	565	12	9
Wasleys Women's	576	5	2
Watervale	*	16	20
Weavers	*	9	13
Wepowie	*	9	6
Wepowie Women's	*	—	—
Whitwarta	565	R	20
Wilkawatt Women's	*	17	21
Williamstown	565	—	—
Williamstown Women's	*	4	—
Willowie	*	23	27
Wilmington	565	17	21
Wilmington Women's	576	R	R
Wirrabara	*	—	—
Wirrabara Women's	575	19	16
Wirrilla	*	7	R
Wirrilla Women's	*	5	2
Wolseley	*	14	R
Wudinna	*	—	—
Yadnarie	*	10	7
Yandiah	565	13	10
Yeelanna	*	4	8
Younghusband	*	—	—
Yundi	566	—	—
Yurgo	*	—	—
Yurgo Women's	*	—	—

* No report received during the month of October. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

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[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

LIFE MEMBERSHIP OF THE AGRICULTURAL BUREAU.

At the meeting of the Advisory Board of Agriculture, held on 30th October, the honour of Life Membership of the Agricultural Bureau was conferred on Messrs. P. R. Parker (Butler), J. McInerney, H. C. Mills, O. E. Longbottom (Riverton), S. Shepherd (Kybybolite), and J. H. Vigar (Mount Hope), in recognition of 20 years' association with the Agricultural Bureau.

UNPRODUCTIVE LAND ON THE BLOCK.

At a meeting of the Ramco Branch on 9th September, Mr. E. Borroughs read the following paper:—On most blocks there are patches not in any way subject to seepage, which are principally planted to vines which do not thrive. These patches grow weeds and cover crops well. The top soil appears to be all right, but the subsoil appears to be poor. Various manures have been tried on these patches, but they make no appreciable difference. The vines become weaker in growth, the butts are cracked by the sun, and eventually they provide a harbour for white ants. It is considered to be due to salt trouble by some experts, who recommend irrigating under the vines and numerous furrows between them, thus wetting as much as possible of the ground surface and pushing the salt down. This was tried on a patch of currants, which appear to have improved in growth, but as it has only been tried during the last 12 months, it is not long enough to prove if the method is worth while. Trees, orange or apricot, seem to do well in this type of soil for a time at least, but how long they will continue to thrive it is hard to say. These patches could be planted with lucerne; it does well, is good stock fodder, and should improve the soil for future planting. Any spare lucerne can be used as humus and buried in the middle furrow. If the ground is planted with trees, a strip of lucerne can be put along the centre of the row. Narrow beds of lucerne can be flooded quickly, and it does not require much grading. (Secretary, J. J. Odgers.)

FALLOWING.

At a meeting of the Brimpton Lake Branch held on 22nd August, Mr. M. Aikenhead read the following paper:—

To get the best results from cereals the crop should be sown on bare fallow. Although some good crops have been got from ploughed-up grass land, it pays to fallow in nine seasons out of ten. Fallowing conserves the moisture from the winter rains previous to seeding. As much as 4in. of rain can be carried forward from the year before for the benefit of the young crop by careful fallowing. The rain penetrates to the subsoil and evaporates during the summer, but evaporation can be retarded to a certain extent if the surface is kept loose. Fallow also enables the farmer to put in his crop at the proper time, and whenever favourable conditions occur. The mouldboard plough is preferable for fallowing, because it leaves a level bed and will get rid of stumps more quickly than the disc. A good disc may be used, if there is too much rubbish for a foot plough. There is no hard and fast rule as to the depth of ploughing—2 to 2½in. is deep enough in heavy ground and less in sand. Fallowing should be commenced as soon as possible after seeding. Early fallowing conserves the maximum of moisture. One disadvantage of early fallow with certain classes of land is that it sets hard with the heavy rains. Fallow should be harrowed about a fortnight after ploughing to break up the plough-furrows and cover any weeds that have not been properly covered when ploughing. The fallow should be cultivated soon afterwards to kill any weeds that may survive; also to loosen the surface. However, it is not wise to work any soil when it is too dry—it is supposed to encourage take-all. This is where sheep are an advantage on fallow. Should the ground become too dry to cultivate, sheep can be put on to keep the weeds in check until such time as the fallow can be worked. Further, it may not be wise to work the fallow when dry; but should it still continue to keep dry, it is better to work it than not at all. The type of implement to use for cultivating is important. The best implements are harrows, skim plough, spring tine and rigid tine cultivators. The number of times the implements should be used is governed by the number of useful rains and the amount of weeds developed. Where possible after summer rains cultivate the fallow. Many fallows are worked well up to a point and then let go. (Secretary, P. H. Wagner.)

BARLEY.

The following paper by Mr. N. Scholz was the subject of a meeting of the Murraytown Branch held on September 7th:—

With the present low price ruling for wheat, naturally every farmer is alert to exploit every possible avenue whereby additional income may be derived. Barley is a cereal that can be grown with advantage to the farmer in wet to moderate rainfall areas, and the crop can be utilised either as a green fodder or as grain.

Types of Barley.—There are two distinct types of barley: Cape or six-row barley, which is recommended for grazing, and is also capable of returning a very high yield of grain; and malting or two-row barley, which is used more extensively for malting purposes. There is another type known as skinless, which is noted for its drought-resistant qualities, but as its characteritics are similar to Cape, I have included it under that heading.

The Seed Bed.—Barley is an ideal stubble cereal, and I would recommend its sowing on stubble land after a crop of wheat. The stubble should be worked fairly deeply, preferably with a rigid tine cultivator, because barley, unlike wheat, does not require a firm seed-bed. The surface-feeding habits of barley roots require a fairly loose seed-bed worked down to a fine tilth and free from clods.

Pickling.—Barley is particularly liable to smut—loose and covered smut. It can be pickled in the same way as wheat, but if wet pickled it requires longer immersion, and if possible it should be sown under moist conditions, as it will be less subject to smut.

Sowing.—Barley should be seeded at the rate of a bushel to the acre, and 80 to 90lbs. of super, and a little sulphate of ammonia can be used with advantage, particularly if the crop is intended for grazing. The time of sowing depends on what the crop is required for. If solely for grain, it is better to delay sowing until the latter end of seeding, because barley has a shorter growing period and will mature under very dry conditions where wheat and oats will pinch and shrivel. If intended for grazing it should be sown early in the season. It can be grazed until August and will then be capable of giving a good return of grain. It can be harrowed with advantage when grazing is completed and then left to grow for grain. Malting barley is not recommended for grazing purposes. It does not recover as quickly as Cape after grazing, but it is recommended for its very high yielding and feeding qualities as grain.

Harvesting.—Harvesting is not as difficult a matter as it is made out to be. The crop should be dead ripe and the comb of the header should be opened out a little. A little tail left on the seed is desirable, especially in the case of malting barley. Sometimes it is necessary to remove some of the concaves for harvesting malting or two-rowed barley. A header makes a much better job than a stripper-harvester.

Advantages and Uses of Barley.—Barley as a green fodder is to be preferred to wheat or oats because it is much quicker growing, more palatable to stock, responds quickly to rain, can hold its own with weeds, and is capable of maturing normally under dry spring conditions. As a grain its commercial value is higher than oats. It is capable of giving a higher yield per acre than oats, and its digestible nutrients as a grain compare favourably with oats:—Barley: crude protein 6.0, fat 1.3, nitrogen 69.7, fibre 1.4, starch equivalent 78.7; oats: crude protein 7.6, fat 4.2, nitrogen extracts 46.2, fibre 3.7, starch equivalent 62.7. Barley can be used as a green fodder for all stock, for ensilage, and grain for pigs. It is ideal for baconers (with skim milk), for working horses at the rate of 4lb. per horse per day, and for sheep. When crushed it is recommended for feeding milking cows. Barley is of more value to the farmer than oats. (Secretary, E. B. Pitman.)

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
South-Eastern District.				
Mundalla	18/10/35	16	Congress Delegates' Report	A. Ross
Mundalla	24/10/35	21	Woolclassing—C. A. Goddard	A. Ross
Allandale East	10/10/35	13	Congress Delegates' Report	R. T. Laslett
Penola	22/10/35	6	Congress Delegates' Report	F. W. Hinze
Tantanoola	12/10/35	11	Congress Delegates' Report "Dairy Produce"—L. Medhurst	L. J. C. Osborne
Mount Gambier	6/9/35	18	"Fodder Conservation"—A. C. MacMillan	J. E. Morphett
Upper North District.				
Appila	4/10/35	13	Report of Booleroo Conference—T. A. Lange	E. H. Wurst
Yandiah	11/10/35	9	Crop Inspection	E. C. Keller
Baroota	14/10/35	13	Congress Delegates' Report	E. W. Hulster
Warcowie	8/10/35	8	Congress Delegates' Report	A. F. Crossman
Wilmington	8/10/35	14	Congress Delegates' Report "The Bushman's Compass"—J. J. Modystach	Chas. Cole
Booleroo Centre	27/9/35	9	"Power Farming"—J. B. Heddle	J. J. McCarthy
Mid North District.				
Wandearah	24/9/35	20	Congress Delegates' Report	L. A. Jacobs
Redhill	1/10/35	5	Congress Delegates' Report	L. Harris
Narridy	5/10/35	18	Congress Delegates' Report	J. Klingner
Hilltown	4/10/35	19	Inaugural Meeting	L. J. Harvey
Narridy	28/10/35	36	Address—W. J. Spafford	J. Klingner
Jamestown	30/9/35	15	Homestead Meeting at W. E. Symonds' property	R. B. Phillips
Lower North District.				
Blyth	2/9/35	—	Social. Address—W. J. Spafford	R. H. Eime
Blyth	13/9/35	—	Woolclassing Demonstration—C. A. Goddard	R. H. Eime
Greenock	23/9/35	25	Woolclassing Demonstration—C. A. Goddard	A. A. Schubert
Owen	7/10/35	19	Address—M. W. Aird	A. W. Helps
Penwortham	28/8/35	15	Formal Business	A. R. Jenner
Penwortham	26/9/35	10	Address—D. Martin	A. R. Jenner
Truro	23/9/35	—	"Farming in Western Australia"—Rev. W. Catterall	L. S. Davis
Truro	21/10/35	8	Formal Business	L. S. Davis
Wasleys	10/10/35	23	Addresses	C. R. Currie
Wasleys	24/10/35	12	Congress Delegates' Report	C. R. Currie
Alma	8/10/35	10	Address—W. J. Marshman	E. H. Drescher
Rosedale	22/10/35	11	Address—C. F. Anderson	W. E. George
Hanson	26/10/35	20	Tour of District	M. de N. Lucas
Hanson	8/10/35	11	Congress Delegates' Report	M. de N. Lucas
Stockport	11/10/35	9	Congress Delegates' Report	R. V. Koch
Koonunga	9/10/35	8	Congress Delegates' Report	H. Mibus
Light's Pass	7/10/35	19	Congress Delegates' Report	C. A. Verrall
Whitwarta	30/9/35	17	Congress Delegates' Report	F. J. G. Collins
Whitwarta	22/10/35	14	Papers from *Journal*	F. J. G. Collins
Sutherlands	3/10/35	10	Exhibit Evening	L. B. Doecke
Lone Pine	16/9/35	20	Discussion	T. Fromm
Williamstown	11/10/35	10	Woolclassing—C. A. Goddard	W. R. Parmenter

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		YORKE PENINSULA DISTRICT.		
Boor's Plains ..	10/10/35	68	Field Day	S. G. Chynoweth
Paskeville	17/10/35	15	Congress Delegates' Report	J. Prouse
Brentwood	5/9/35	62	Debate with Minlaton Literary Society	J. H. Boundy
Brentwood	14/10/35	8	Discussion	J. H. Boundy
Arthurton	26/9/35	28	" Pasture Improvement "—A. B. Ferguson and O. D. Jericho	T. H. Howlett
		WESTERN DISTRICT.		
Miltalie	28/9/35	19	Congress Delegates' Report	S. D. Ramsey
Mount Hope....	1/10/35	12	Question Box	J. L. Vigar
Pinbong	5/10/35	15	Paper from *Journal*	D. O. Scholz
Pinbong	7/9/35	15	Paper from *Journal*	D. O. Scholz
Green Patch ...	10/10/35	18	Address—H. D. Adams .	C. J. Whillas
Maltee	10/10/35	12	Address—A. Edson......	E. Schwarz
Kelly	12/10/35	20	Address—W. J. Spafford	F. R. Illman
Koppio	11/9/35	11	" Care of Wool "—D. G. Barlowe	M. T. Gardner
Koppio	14/10/35	13	Congress Delegates' Report	M. T. Gardner
Brimpton Lake .	10/10/35	13	Congress Delegates' Report " Food for the Wheat Plant "—E. R. Wannan	P. H. Wagner
Warramboo	11/10/35	5	Congress Delegates' Report	H. F. Chilman
Warramboo	6/9/35	—	Discussion—Congress ...	H. F. Chilman
Goode	16/10/35	11	Congress Delegates' Report	B. A. Linke
Brimpton Lake .	9/9/35	15	Discussion—Congress ...	P. H. Wagner
Pygery	24/9/35	—	Discussion—Dipping Sheep	A. Day
Pygery	8/10/35	11	" Our Dairy Cows "—R. Woodrup	A. Day
Laura Bay	8/10/35	18	Congress Delegates' Report	P. S. Morrison
		EASTERN DISTRICT.		
Karte	11/9/35	32	Discussion	M. E. Small
Karte	16/10/35	23	Congress Delegates' Report	M. E. Small
Chapman Bore..	9/9/35	16	" Care of Machinery "—Secretary	J. P. Krollig
Chapman Bore..	9/10/35	14	Social Evening..........	J. P. Krollig
Coomandook ...	28/10/35	15	Woolclassing—D. Dunsmore	W. R. Trestrail
Lameroo	25/10/35	11	" Pigs and their Management "—R. C. Pocock	A. G. Potter
Berri	14/10/35	13	Congress Delegates' Report	E. J. R. Johnson
		SOUTH AND HILLS DISTRICT.		
Milang	27/9/35	18	Address—C. A. Goddard	L. E. Yelland
Blackheath	26/9/35	7	Items of Interest	E. H. Paech
Yundi	25/9/35	—	" Rearing Pigs and Calves "—H. Peters	T. R. Smart
Inman Valley...	26/9/35	16	Address—Dr. Souter	S. F. Hacklin
Inman Valley...	24/10/35	21	Addresses—A. M. Fuller and H. J. Jagger	S. F. Hacklin
Scott's Bottom .	14/10/35	7	Address—O. Ringvall....	E. L. Atkinson
Hope Forest ...	7/10/35	22	" Poultry "—P. Wollaston	H. J. Hunter
Hartley	11/10/35	14	Address—H. H. Orchard	W. J. Brook
Longwood......	12/10/35	15	Homestead Meeting at A. Bone's property	H. G. Haines
Cherry Gardens	12/10/35	14	Homestead Meeting at J. C. Blakely's property. " Fattening Fowls "—I. Stone	A. R. Stone
Blackheath	7/10/35	5	Congress Delegates' Report	E. H. Paech
Monarto South .	19/10/35	21	" Haymaking "—H. B. White	C. F. Altmann
Tweedvale	19/9/35	19	" Modern Methods in the Dairy "—V. Gurr	B. Schapel

FORTY-SIXTH ANNUAL CONGRESS—WOMEN'S BRANCHES.

(*Continued from page* 431.)

Wednesday, 18th September.

Morning Session.

A demonstration on the general handling of a sewing machine and its accessories was given by Mr. T. Chandler, of the Singer Sewing Machine Company.

HERBS, SPICES, AND CONDIMENTS.

[MRS. EDITH KIDMAN.]

Success in cookery depends to a large extent on the proper use of seasonings and flavourings, and greater attention than is usually thought necessary should be paid to this point. A certain amount of skill is needed to use different flavourings properly and to judge the exact amount required. No cookery book can teach this, as it is impossible to lay down hard and fast rules, but the knowledge is not difficult to acquire provided the tastes of the individual are considered. Care should be taken to make food pleasing to the palate. It is a mistake to think that simple cookery needs only pepper and salt to make it taste. There are many flavourings which may be introduced to relieve the monotony, though food with an overdose of seasoning should be avoided. It is always best to use it moderately. Whenever possible natural seasonings should be used in preference to made-up sauces or other condiments or flavourings.

Fresh herbs are best, or dried in small quantities, or dried lemon or orange peel are all simple, and do not cost much. The aim with seasoning is to render the food more palatable and more appetising to those for whom it is cooked.

Herbs may be sown in spring or autumn in warm districts. When in full bloom, gather and dry in a warm oven and pack away in airtight bottles or tins. The roots can be divided and planted out each winter. Thyme, Sage, and Marjoram should be in every garden. Mint is generally grown from roots, and thrives best in damp places; an old box or tub near a tap is a good idea for mint as it stops it from spreading.

Angelic Herb is somewhat similar to Rhubarb in size. The stalks are boiled in syrup and candied. They are green in colour, and mostly used for confectionery and decoration. It can be also eaten raw like celery, and is cultivated extensively in China and Japan.

Garlic belongs to the onion family, and has a very strong smell. Often sufficient flavour is gained with cutting a clove of garlic and rubbing the inside of the saucepan or salad dish which is to be used. Garlic should be hung in bundles or put in string bags on account of the odour.

Finely minced *Marjoram* is a favourite ingredient for different forcemeats.

Mint is often used for peas or new potatoes, but principally for sauce.

Nasturtium.—The flowers and leaves of the plant may be used in raw salads and sandwiches. The flowers form a dainty garnish to a green salad. The young green seeds, which resemble Capers, may be pickled. They will also act as a preservative in ordinary pickles.

Parsley is a valuable herb. It can be used for flavouring or garnishing, and may be kept fresh for days in a jar of cold water. Mint may also be kept in this way. Parsley may be dried the same as other herbs, but if required for garnishing the following method should be adopted:—Choose curly parsley, wash and divide into small sprays, place in a wire basket, and plunge into a saucepan of boiling salted water. Leave for one minute, then spread out on a paper or rack to dry. Store in a wide-mouth bottle. When wanted soak the required amount in warm water a minute or so and shake out for use.

Sage belongs to the Mint family, and it is used mostly in forcemeats, stuffing for poultry and pork.

Shallot is a small member of the onion family, and is used where a mild flavour of onion is desired.

Thyme is a very old favourite used in nearly all forcemeats.

Mustard is made from seeds of Mustard plants. If a mild flavour is desired, mix with milk or cream instead of water. Mustard should be prepared in small quantities as it deteriorates. A dessertspoon of Mustard added to the water in which corned meat is cooking improves the flavour, especially corned beef, and makes it very tender.

Mustard Sauce.—Large ½ cup of the liquid in which corned beef has been boiled, ½ cup vinegar, 1 tablespoon mustard, 1 egg, 3 dessertspoons sugar. Mix egg, mustard, and sugar together, add ½ cup vinegar and ½ cup liquor. Stand on side of stove until hot without boiling. Serve with either hot or cold corned beef.

Horse Radish is used principally as a condiment. It is very stimulating, and has a strong, acrid taste. When made into a sauce is the correct accompaniment for roast beef.

SPICES.

Spices are derived from fruit, seeds, and the bark or roots of various plants. They are used to impart flavour and improve the taste of dishes. They should be kept in airtight tins or a spice chest.

Allspice is made from the berry of a small Pimento tree which grows in hot climates. It imparts the flavour of cinnamon, nutmeg, and cloves, hence the name "Allspice."

Aniseed is very aromatic, and is used in confectionery and flavouring liquids.

Capsicum is the name gven to an order of plants such as Chillies, which are ground and made into Cayenne Pepper. They are bright red in colour, very pungent and stimulating. To ward off an approaching cold, pour a cup of boiling water over four or five chillies and allow it to steep, then strain off and add the juice of half a lemon. The liquid should be taken after meals.

The *Carraway* root resembles the carrot in form. The seed is very aromatic, and is used for flavourings.

Cinnamon is the dried inner bark of a small evergreen belonging to the Laurel family. Cinnamon bark is closely rolled, and has a pleasant taste. It can be also had in ground form, or as Oil of Cinnamon.

Cloves grow on a tree resembling Myrtle, and is a hot climate plant. The buds are red before being dried. They have a powerful fragrant odour, and are used to flavour savoury dishes.

Curry.—A mixture of various spices Chillies, Coriander, Ginger, Tumeric, &c.

Ginger.—The underground stem root of the Ginger plant. It can be obtained in different forms.

Nutmeg and Mace.—Nutmeg is the kernel of a fruit tree belonging to hot climates, and should be used with caution. Mace is the outer covering of the nutmeg flattened and dried.

Pepper.—Black Pepper is made from grinding the berries just as they are. To make White Pepper the dried berries are soaked, the skin removed, and the seed alone ground.

Tumeric is obtained from a tuberous plant belonging to the same family as Ginger which is dried and ground. It has a peculiar odour, and yields a large quantity of yellow matter. It is much used in making curry. It is to Tumeric that the colour of curry powder is due.

Vanilla.—The dried fruit or pod of a climbing orchid which grows in the tropics. It is very much valued on account of its delicious, aromatic fragrance, and is largely used in flavouring.

Vinegar.—A very important condiment derived from various sources. Spiced vinegar is very nice poured over beetroot. It is largely used for pickling, helps to soften the fibre of meat, and makes it tender. It is also useful in giving a piquant flavour to certain dishes.

Ketchup.—Another condiment made from Mushrooms or Tomatoes by boiling them down and squeezing out the juice and adding seasoning to it.

Mushroom Ketchup.—7lbs. mushrooms, ½lb. salt. Gather mushrooms dry. Do not wash them, break them up in a crock and sprinkle with salt, leave two or three days, giving them an occasional stir. Then cook gently until juice is drawn out. Strain through a cloth, and add to each quart of liquid, ½oz. peppercorns, ½oz. bruished ginger, 1 blade mace. Boil from two to three hours. Strain, bottle, and cork tightly.

Mr. J. J. Jones, of Kodak (Australasia) Pty. Limited addressed delegates on "Photography."

QUILTS, QUILTING AND PATCHWORK.

[Mrs. E. L. Orchard, Belalie.]

Quilts, quilting, and patchwork are associated, because quilted patchwork quilts are so popular in cycles of time and are suitable in their varying combinations for all types of homes, from the humble cotton patchwork quilt made from scraps from the sewing bag to the handsome shirred satin eider filled hand quilted bed cover. Patchwork is glorified mending, and can be absorbingly interesting, whether it be a patchwork quilt for the nursery or a dignified parrot in gaudy colours to ornament a cardboard box in which to post a birthday gift.

Silk, leather, lace, and paper all have decorative uses, and with a suitable assortment of colours and materials and a skilful method of assembling and joining the pieces, patchwork can be raised to the level of an applied art if a good design

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is first originated or copied. Care must be taken, however, to cut and join the requisite patches to carry out the definite patterns or pictorial effect selected. Designs must have suitable relation to the objects to be made or partially covered with patchwork. They must also be chosen with regard to the materials that the worker wishes to utilise.

It is a mistake to mix patches of heavyweight with thin fabrics; the pieces should be of average weight throughout the work. Ornamental and durable accessories for the home can be made from patches of coloured leather or from mixing them with other suitable materials such as velours or velvet. Floor cushions, pouffés and shopping bags are amongst the best articles on which to use leather patchwork. A sharp knife and solid board to work on are better than scissors for cutting heavy leather. Fine soft leather can be stitched on the sewing machine; and heavy leathers, punched with holes very evenly gauged, are thonged together. When patches are intended to match each other they must be cut to *exactly* the same size. It is a good plan to make a template out of cardboard to guide the scissors. Cut the patches larger than the template to allow for turnings, then lightly paste pieces of writing paper cut to the exact size of the template to the back of the leather or velvet patches in order to ensure even turnings.

For articles of thin materials such as cushions, evening bags, or dressing gowns, scraps of velveteen, ribbon, floral or plain silk, linen, or cambric are suitable, only it is advisable not to mix silk and cotton.

The velvet cushions of long ago used to be known as crazy work, and the cushions were marvellous blends of colour and fabric pieced together like crazy pavements so popular just now, with faggotting, chain stitch, or feather stitch; some were flat and others round, and each small patch was carefully padded with cotton wool.

Oddments of old point lace or any hand-made laces can be arranged on a dark background, covered with glass, backed with three-ply wood, and framed to make an ornamental and useful tray.

The 18th century craft of making patchwork pictures from scraps of coloured papers has recently been revived. In this work nothing but coloured paper is used, each petal, leaf, and flower centre—or if a bird design is used, each feather—is cut out separately and pasted on the background, and no drawing is done on the paper either before or after it is cut. The most beautiful colours can be obtained from using good coloured advertisements and cutting out each tiny section from these in the tint required. For making these pictures a sense of colour is necessary, accuracy with the scissors, and plenty of scraps of every conceivable colored papers from cuttings of brown and blue shopping paper to scarlet tea packets, silver paper, and fragments of wall paper.

This bridge bag (exhibited) is made from scraps of green and black velvet. The pieces of cardboard were cut accurately from a template, and then covered with the velvet, allowing ¼in. for turnings, then top sewn on the wrong side, the cardboard being removed when completely surrounded with other covered pieces. To allow for straight edges four sides instead of six are joined. The lining and zip fastener are fixed in the usual way. The not quite finished cushion cover (exhibited) will show the method adopted.

Pretty patchwork quilts can be made for summer use in the nursery from 2yds. of white calico for a background, 1½yds. of coloured cambric cut in strips for a border, and two linen picture books. Cut the pages from the books, turn the edges under, and place to form alternate oblongs or squares of plain calico and pictures, stitch with the machine or chain stitch by hand, and add the border.

Bags made of alternate plain material and floral patchwork 12in. square can be filled with scoured wool and top sewn together to make a warm quilt for the winter

The most expensive quilt is the satin, down-filled quilt, made with down obtained from the Eider duck. Less expensive but quite soft fillings are cygnet and goose down. Kapoc, sheep's wool, and cotton wool are used extensively. *The stitch* *which holds a lining padding in place under another material is known as quilting.* Eider down from the breast and neck of the Eider duck is the softest filling known. If using down or feathers the inside of the covers should be soaped or waxed to prevent the feathers working through; with cotton wool or sheep's wool this is not necessary.

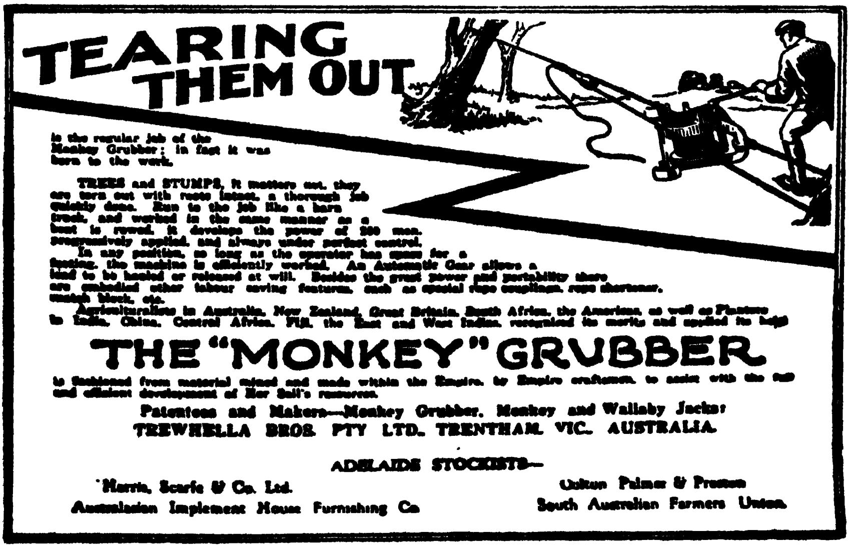
A very serviceable quilt can be made from down-proof sateen and carded wool. Sateen does not slip off the bed as easily as satin.

QUILTING.

The process for this interesting type of quilt (exhibited) is first to make or procure a quilting frame 6ft. 6in. long with ends slotted to allow a spacing board measuring 2ft. 3in. long to be pushed through; the spacing board having small holes about 1in. apart evenly spaced with pegs to fit the holes, two for each board.

Tack firmly along one side of each long board a length of furniture webbing. This is then ready to tack or sew the cover to. The first step is to join, if necessary, boards or shirred pieces to the cover the correct size required, allowing 1in. turnings all around. Press carefully all seams or joins, and then on the plain side or top mark design with chalk. Dishes make very good articles for preparing a design. A meat dish will give a good shape and size for the centre, then any lines can be made to conform to a geometrical or unconventional pattern.

For the beginner it is best to commence with a simple design. When all the lines are chalked on, the sides of both plain and floral sateen (if floral is to be used for under side) with right sides to the outside, must be sewn to one webbing and the floral only to the other webbing; then wind up the board with only the floral piece on until sufficient is left to work on conveniently. Place the spacing boards in the slots, and arrange the pegs to hold the work firmly apart. Next fold back the chalked piece and lay on the inside of the floral piece the teased carded wool, placing a piece of butter muslin over it wherever there is not much quilting to be done and tack the muslin firmly to the wool. Place the chalked piece back over the wool, and pin firmly wherever needed to keep everything in place. Now with a fine running stitch and an occasional back stitch proceed with the quilting, following carefully the chalked lines. As one part is worked remove the pegs, take out the spacing boards, roll up the worked part, and unroll the floral under side, then repeat the process. When all the quilting is completed **tack firmly** about 2in. from the edge, and see that the wool is every evenly dis-


TEARING THEM OUT

is the regular job of the Monkey Grubber: in fact it was born to the work.

TREES and STUMPS, it matters not, they are torn out with roots intact, a thorough job quickly done. Run to the job like a barrow truck, and worked in the same manner as a boat is rowed. It develops the power of 200 men, progressively applied, and always under perfect control.

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Agriculturalists in Australia, New Zealand, Great Britain, South Africa, the Americas, as well as Planters in India, China, Central Africa, Fiji, the East and West Indies, recognised its merits and applied its help

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is fashioned from material mined and made within the Empire, by Empire craftsmen, to assist with the full and efficient development of Her Soil's resources.

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Harris, Scarfe & Co. Ltd.
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South Australian Farmers Union.

tributed at the corners. Turn edges to face, put in a piping to give a professional touch, pin and tack thoroughly, then machine stitch very close to the edge. Work about five eyelet holes for ventilation, and the quilt is finished.

For a single bed quilt—if made of one side plain and one side floral—3yds. of each 31in. wide are necessary, and will make a quilt 2yds. long and 1½yds. wide. For a double bed 4½yds. of each are needed.

When making a quilt with a contrasting border be sure and mitre the corners carefully. When making a feather, down, or kapoc filled quilt the case is sewn to make a large bag with part of one side left open for filling and securely stitched afterwards. It should then be placed quite flat on a large table or bed, or on the floor, and the filling arranged as evenly as possible by careful shaking and tapping with the hands. Without disturbing the down, tack along the lines marked for quilting, making sure that all the tacking stitches go right through to the under side of the case. This is most important, as otherwise, when quilting, the depth of the down padding will become uneven, and the appearance of the quilt will be spoiled. A thread for tacking in a contrasting colour helps.

If the quilting is to be done by hand fix to the long boards of the quilting frame and work as described for the wool-filled one. If to be machined test the machine to procure a long stitch with neither top nor bottom tension tight. No trace of any puckers should be seen in the stitching. When the machine is adjusted satisfactorily raise the pressure foot to its greatest height, pass the quilt under it, commence stitching, and *do not hurry the process.* The quilting completed the tacking cottons should be removed carefully so that no down is drawn through in doing so, and about five eyelet holes worked at suitable distances from the centre of the quilt to provide for ventilation. The *Chronicle* "Bird and Farmyard Quilt Designs" are suitable for hand quilting, with perhaps honeycomb or diamond quilting in the plain squares, which combines successfully patchwork and quilting.

Most attractive for a country bedroom is a quilt made from an idea brought from the West Indies early in the 18th century composed of rosettes of patterned cottons as worn by the plantation negroes. Any prints, sateens, or artificial silk can be used provided the scheme is harmonious and the effect light and dainty. The method of making is simple. Cut out a cardboard template about 5in. in diameter, the paper shapes to correspond, and the pieces of material allowing for turnings. Having tacked these to the papers whip around the edges of the material, and before drawing up tear away the paper. Each rosette is like a little flattened circular bag with the gathered top uppermost, and is joined by a few stitches to the adjacent patches, but made up in such a way that the quilt has an open-work effect through which the lining composed of some plain coloured suitable material shows.

In Wales as early as the Tudor period women worked fancy quilting on bed covers, and the designs handed down by them are still being used by the women in the colliery villages. The quilting is very finely worked, the background being entirely covered with fine diamond-shaped lines and the design standing out in bold relief.

In Wales the quilts are filled with sheep's wool or cotton wool. An example of English quilting I have seen lately was a pretty blossom and leaf embroidered in coloured threads on pale pink crepe-de-chene filled with cotton wool and stitched in large diamonds to allow the embroidery to come in the centre of the diamonds. This type of quilting is also suitable for baby's shoes, bedroom slippers, and dressing gowns.

Quilted cushions and handbags are usually worked differently from bed coverings. The design is stamped on to cotton or muslin, the silk placed over it (sometimes with a thin layer of cotton wool between), then quilted. The design is given an embossed bas-relief effect by means of cotton stuffing introduced through slits in the underside of the stamped lining. After the padding is put in the slit is drawn together tightly with a tacking thread.

As in quilting bed covers, the stitches must all go clear through the silk or outside covering, as the stitches form the design. Squares knitted or crocheted in white knitting cotton and joined to make quilts are familiar to all.

The newest popular old style of bed coverings is the Afghan, worked in squares of multi-coloured wools, blended for pleasing effect, and joined with black to show up the colours; 216 4in. squares arranged in 18 rows of 12 each will make a cover large enough for a single bed, and if 6in. squares are used 108 will be sufficient. Worked in all treble or tricot centre with treble around they are very effective. For this odd scraps of wool can be used.

These ornaments (exhibited) are glass jars painted with black enamel, pictures cut from magazines and cut into triangles or other shapes and pasted on to the jar. Each piece is outlined with black Indian ink and a few irregular lines drawn, then given a coat of clear varnish. Each coat must be allowed to dry thoroughly before applying the next, and the finished article certainly repays for the time spent.

These examples (exhibited) will show that patchwork and quilting to persons who have the opportunity and inclination can be most useful and interesting handicrafts, and are amongst those that have stood the test of time.

Afternoon Session.

Miss E. Campbell, Dip.Dom.Econ. (Inspector of Domestic Arts, Education Department) took as the subject of her address "Suggestions to Make the Work of the Housewife Easier."

Mr. T. Hewland, member of the Dairy Produce Board, explained to delegates the reasons for the introduction of the butter tax.

RE-COVERING UPHOLSTERED CHAIRS, ETC.

[MRS. A. W. WILSON, Wasleys.]

Most housewives at some time or other find themselves with chairs that need recovering. To send them to an expert is usually an expensive and inconvenient undertaking. They can, however, be re-covered at home at less than half the cost. Watch the sales and purchase materials at the lowest possible cost. Tapestries, shadow tissue, &c., are often very genuinely reduced at special sales. An ordinary easy chair requires 5 yards of single width material or 3 yards of double width. Single width is more economical. A little material can be saved by sewing hessian on to the cut-out pieces, which does not show when the chair is finished. It is wiser to use the material right through. Then at some later date when the chairs need renovating again, pieces can be taken off and replaced with hessian.

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Before putting on the new covering, see that the springs are all securely in place. and the bands strong and firmly tacked. (Mrs. Wilson at this stage demonstrated how to do the upholstering.)

Boxes to hold hats or blankets, &c., can be made attractive by padding and covering them. Old frocks in silk, wool, or cotton make excellent padding. Wash them and put aside until required, then spread them out evenly, and tack on to the sides and lid of the box. They do not have to be cut into small pieces. Tack a firm covering over the padding and then proceed with the tapestry, linen, or whatever covering is to be used. Stretch on firmly, tacking securely at the corners and top and bottom. The inside can be finished off with sateen or ordinary wall-paper pasted in.

An ordinary light deal box purchased from the grocer, with hinges and castors added, and covered in this way makes a much more attractive receptacle for hats, etc., than the ordinary hatbox pushed up on top of the wardrobe.

GENERAL HINTS ON THE COOKING OF PUDDINGS.

[Miss N. A. MATTISKE, Pinnaroo.]

Farinaceous Puddings.—The proportion of rice, tapioca, sago, cornflour, arrowroot, &c., to milk for a pudding of ordinary consistency is 2 tablespoons or 2ozs. of rice, &c., to 2 breakfast cups of milk. These puddings are best cooked slowly in order to let the grains swell properly. If eggs are added, cook the grains well before adding the eggs.

Custard Puddings.—If baked, custards must be cooked slowly to prevent the eggs curdling. (The pudding dish may be placed in the oven inside another dish containing water.) If boiled or steamed the water must not go above simmering point for a like reason.

Suet and Other Fats for Puddings.—Beef suet is best for boiled puddings. Veal suet or the outside fat of a loin or neck of mutton is sometimes used to make common crusts.

Clarified Beef Dripping and the fat skimmed from the water in which beef or mutton has been boiled (if without vegetables) may also be used. Butter is often used for good puddings, but it is too expensive for common use.

Suet is best fresh. It must be freed from skin and very finely chopped with a little flour dredged over to prevent sticking. Suet requires longer boiling than either butter or dripping. The proportion of fat (suet, dripping, or butter) to flour for both boiled puddings and common pastry is not less than ½lb. fat to 1lb. of flour (or flour and crumbs mixed). If wanted richer, more fat is used.

If dripping or butter is used instead of suet in a boiled pudding, use less of either of these than of suet; say, 6ozs. of butter or dripping as a substitute for 8ozs. of suet. Suet puddings should be served with sauce.

Pudding Cloths.—These should be kept for the one purpose. When washing, use no soap if possible, lest it should flavour the next pudding. Dry in an airy place, and keep very clean.

To Mix Puddings.—Have everything ready. Prepare mould or basin by greasing and ornamenting (if necessary) before starting to mix ingredients. Have suet ready chopped. Mix all dry ingredients thoroughly, then add the liquid ones, the eggs last. Most Plum Puddings are much better if chief ingredients are mixed some time before cooking, but in this case always keep out the eggs, baking powder, soda, or cream of tartar. Add these just before cooking.

To Steam Puddings.—Place the mixture in a well greased basin or mould. Leave room for swelling. Place a buttered paper (cut larger than the top of basin). This prevents the steam, which condenses on the lid, from dropping into the pudding. Tie the basin in a pudding cloth and place in a steamer, or in a pot with boiling water to reach half-way up the basin. The water *must* be boiling well before the pudding is put in. Fit on the lid and do not remove it unless necessary to refill with *boiling* water, as this constantly evaporates. The water *must* be kept boiling all the time.

To Boil Puddings.—In using a pudding cloth only dip it in boiling water, wring out, and dredge with flour. Place pudding mixture in centre and gather up the edges. Allow a little room for the pudding to swell, then tie the string very tightly. If using a mould or basin, grease it well and fill it quite full. If the mixture is not sufficient for this, use crusts of bread to fill up, and remove them before dishing. They absorb the water and prevent the pudding from being heavy. Dip a pudding cloth in boiling water, flour it, and tie it over the top of basin. Place the pudding in plenty of boiling water so that it is well covered, and keep boiling all the time. Keep the lid on the pot, and if water evaporates add more boiling water.

To prevent a pudding boiled in a cloth from sticking to the pot, put a saucer or plate underneath the pudding. Always allow the pudding to stand a minute after taking it out of water, before turning it out, to prevent cracking. If boiled in a cloth dip in cold water for a second on taking from the pot to prevent it sticking. Have a hot plate ready and turn the pudding on to it. There should be no trouble in freeing the cloth. If a basin has been used, place the hot plate on top of mould or basin and invert the basin, when the pudding should leave the basin.

The following resolutions were carried:—

"That the ladies' pages in the *Journal* be improved. Failing this, would it be possible to include a special supplement for the ladies in the *Journal?*"

"That the Government be asked to consider sending a dentist to country schools at least one visit annually."

"That the necessary steps be taken to reduce freight on fruit and vegetables for outback people, especially West Coast settlers."

"That Bureaux be allowed to suggest subjects of educational value for the Bureau wireless talks."

"That producers operating under the Farmers Assistance Board are entitled to an additional money grant for Christmas."

"That we protest against any further reduction of the maternity bonus."

Thursday, 19th September.

During the morning delegates vistied the Waite Research Institute and in the afternoon the Onkaparinga Woollen Mills at Tweedvale.

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			WOMEN'S BRANCHES.	
Clare	7/9/35	33	Rug-making	Mrs. A. Pollock
Snowtown......	5/9/35	24	Address—Clarkson Ltd. .	Mrs. A. Hocking
Snowtown......	27/9/35	17	Address—C. F. Anderson	Mrs. A. Hocking
Gladstone	24/9/35	21	Congress Delegates' Report	Mrs. L. J. Sargent
Saddleworth ...	1/10/35	12	Congress Delegates' Report	Miss G. E. Frost
Rendelsham ...	2/10/35	18	"Flowers"—Mrs. Bryant and Miss Marian	Mrs. W. Bignell
Balumbah......	2/10/35	11	Congress Delegates' Report	Miss H. D. Jericho
Sheoak Log.....	2/10/35	19	Congress Delegates' Report	Miss K. M. Koch
Auburn	27/9/35	21	Congress Delegates' Report	Miss L. J. Dennison
Penola	2/10/35	33	Congress Delegates' Report	Mrs. F. J. Kidman

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
WOMEN'S BRANCHES—*continued.*				
Wirrabara	24/9/35	20	Congress Delegates' Report	Mrs. A. Curtis
Narridy	5/10/35	18	Congress Delegates' Report	Miss B. J. Reynolds
Millicent	25/10/35	15	Congress Delegates' Report	Miss K. Hutchesson
Nelshaby	10/10/35	15	Congress Delegates' Report	Miss A. Lawrie
Karte	11/10/35	15	Congress Delegates' Report	Mrs. F. N. Atze
Mudamuckla	4/10/35	13	Congress Delegates' Report	Mrs. C. H. Kuhlmann
Tantanoola	2/10/35	12	Congress Delegates' Report	Mrs. Gus Altschwager
Karte	11/9/35	20	"Three-minute Sponges"—Miss G. Fiebig. "Entertaining Children"—Miss D. Trowbridge	Mrs. F. N. Atze
Morchard	25/9/35	25	Homestead Meeting. "Home Economies"—Mrs. McCallum	Miss F. A. Brown
Waroowie	8/10/35	7	"Economies with Meat"—Mrs. A. F. Crossman	Mrs. A. G. Avery
Mangalo	23/10/35	12	Address—H. D. Adams Butter Competition	Mrs. F. Coles
Kybybolite	9/9/35	16	"Famous Women in British History"—Mrs. L. J. Cook	Mrs. W. D. Kekwick
Wasleys	10/10/35	40	Congress Report, and Flower Show	Miss G. Harding
Boor's Plains	10/10/35	25	Annual Meeting	Miss L. Stanway
Wilmington	10/10/35	32	Address—J. O. Hatter. Butter Competition	Mrs. P. Cole
Pinnaroo	4/10/35	17	"Flowers"—Miss N. Mattiske	Miss N. A. Mattiske
Laura Bay	10/9/35	8	"Christmas Gifts"—Mrs. J. W. Blumson	Miss T. E. Barnett
Wirrabara	17/10/35	39	Homestead Meeting at Mrs. Grant's	Mrs. Alex. Curtis
Gladstone	15/10/35	30	Homestead Meeting at Mrs. Prior's	Mrs. L. J. Sargent
Myponga	17/10/35	12	Inaugural Meeting	Mrs. M. Bounds
Auburn	25/10/35	15	"Scones"—Miss E. Dennison	Miss L. Dennison
Morchard	23/10/35	26	Sponge Cake Competition	Miss F. A. Brown
Belalie	1/10/35	14	"Kindergarten Work"—Mrs. A. M. Sanderoock	Mrs. E. L. Orchard
Clare	5/10/35	58	Social Afternoon	Mrs. A. C. Pollock
Parrakie	23/9/35	15	Question Box	Miss J. Halliday
Monarto South	19/10/35	14	Dark Fruit Cake Competition	Mrs. F. W. Liebelt
Mundalla	18/10/35	21	Nut Loaf and Scone Competition	Miss M. Fisher
Beetaloo Valley	7/10/35	9	"Household Hints"—Miss Ryan; "Rug Making"—Mrs. E. A. Pearce	Mrs. E. A. Pearce
Maltee	10/10/35	7	"Household Hints"—Miss A. Bassham	Mrs. J. Ferguson
Kangarilla	17/10/35	9	Congress Delegates' Report	Mrs. C. Steer
O'Loughlin	14/10/35	11	Congress Delegates' Report	Mrs. E. Lutz
Coonawarra	16/10/35	28	Congress Delegates' Report "Salads"—Mesdames A. and W. Hoffman. "Pudding Recipes—Mrs. L. Redman	Mrs. F. I. Skinner
Georgetown	8/10/35	18	Congress Delegates' Report	Miss J. Crawford

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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Angaston, Saturday, February 29th, 1936.
Mundalla, Wednesday, March 4th, 1936.
Mount Pleasant, Thursday, March 19th, 1936.

Seed Wheat Available from Turretfield.

There is an increasing demand for the selected seed wheat offered for sale from the Turretfield Seed Wheat Farm, and this year supplies of some varieties have already been exhausted.

Wheats which are available include Federation, Nabawa, Ranee 4H, Sultan, Sword, and Waratah, and should grain of any of these varieties be required, early application to the Manager, c/o Rosedale Post Office, is recommended.

The price for graded seed is 4s. per bushel on trucks Sandy Creek or Roseworthy.

Control of "Blue Mould" in Tobacco.

In a report (15th November), Mr. R. E. Courthope Giles (Tobacco Instructor), stated that practically the whole of last season's tobacco crop was affected by "Blue-Mould." With the exception of the Murray Area Experimental Plots, clean leaf was found only on two holdings, one of 2 acres in the South-East, and the other (5 acres) near Victor Harbour.

With one exception, all tobacco seed sown in the South-East this year was obtained either from the Department of Agriculture or from approved stock which had shown some resistance to "Blue-Mould." The exception referred to was the only crop that had developed the disease.

Particular care had been taken by South Eastern growers to keep their seed beds as dry as possible. This factor, and the use of clean seed had, no doubt, helped to prevent further outbreaks of "Blue Mould."

Four of the South Eastern growers whose crops suffered most last season, had since used the Benzol method of raising seedlings, with entirely satisfactory results. Experimental work with this method and with colloidal copper sprays on open beds, was also being carried out by the Department of Agriculture. Approximately 100 acres of tobacco would be planted between Mount Gambier and Culburra this season.

The position was much the same in the Adelaide Hills, and two cases of "Blue-Mould" had appeared, both among seedlings grown in frames without the Benzol fumes. The area to be planted throughout the Hills would be approximately 100 acres, the greater portion of which would be situated in the sand country in the vicinity of Mount Compass. The seedlings were striking well.

Registered seedling growers around Adelaide objected to the use of Benzol on the grounds of the expense and they used seed from outside sources. Their efforts had resulted in complete failure, and their entire output succumbed to "Blue-Mould" in the seed beds.

Five acres of tobacco had been planted in the Stansbury scrub with Dungowan seedlings, grown there in open beds, and were doing very well.

The disease had appeared in the Berri and Loxton areas, and at the Experimental Orchard. Benzol was found to check the spread of the disease and in no way could it be regarded as a cure, but as there was no shortage of clean seedlings, only clean seedlings would be planted out. There would be about 25 acres of tobacco for curing at the Experimental curing barns at Barmera.

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GOODYEAR

FARM IMPLEMENT TYRES

MADE IN AUSTRALIA

Two acres of seedlings grown at Boolgun developed "Blue-Mould" soon after germination; the seed came from an infected farm in Victoria. Mr. Giles suggested that only certified seed should be imported into the State.

Important Weeds of South Australia.

The next article on "Important Weeds of South Australia" by Mr. G. H. Clarke, B.Sc., will appear in the February, 1936, issue.

White Ants.

Pintsch's gas tar (to which a little kerosene has been added) is the material recommended by the Architect-in-Chief's Department for the control of white ants in buildings. All ant-eaten timbers should be removed and replaced by timbers which have been painted with the above material.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

"Hon. Secretary, Pinkawillinie Agricultural Bureau," asks the best method of tying and throwing colts for castration.

Reply—For castration, colts can be thrown satisfactorily by the use of rope sidelines. Take a 50-60ft. rope, lay it out on the ground double and make a loop about 3ft. in circumference in the middle. The person affixing the rope, gathers up the free ends in a coil to prevent its becoming entangled round the colt's legs. Pass the loop over the animal's head, so that it lies round the base of the neck, and pass the coiled ends of the long rope between the forelegs and round the hind legs, from within outwards and above the hocks, to avoid making him kick. The ends are then uncoiled as they are brought forward along each side of the animal, passing them underneath the first part of the rope, and then through the neck loop. One end is held by two men standing in front of the colt, and the other by two men well behind him. The rope where it turns round the hind legs is then allowed to slip down to the pasterns. When finally in position, on the order to "pull," the man holding the colt forces him back, while those on the ends of the rope pull up the slack, and so force the colt to a sitting position, from which he can easily be turned over to the required side. The upper hind foot can then be pulled well up to the shoulder, and two or three half-hitches taken round the pastern to secure it. The top foreleg can then be fastened up by half-hitches round the pastern close to the hind leg. The animal is then turned over, and the other hind and fore leg dealt with in a similar manner. It is very important that when on the ground the colt is not allowed to flex his head and neck, otherwise the loop will slip forward along the neck towards the head, and cause the rope round the hind legs to become slack.

"South Kilkerran," asks treatment of a mare which appears to be carrying a dead foal.

Reply—You do not say how you examined the foetus for signs of life. Unless you examined by passing the oiled arm and hand into the rectum, you would not definitely know whether the foetus was still alive, and it is by no means unusual for a mare to go a month over her expected date of foaling. Make sure that the foal is dead before you start interfering, as mares usually pass the dead foetus without assistance, except in the case of abnormal presentation, in which case he would show uneasiness and labour pains, &c.

"Tanunda," reports a mare 12 *years old with foal at foot, showing signs of blindness.*

Reply—Such blindness can be due to nursing the foal. You may try the following treatment:—Feed on greenfeed, but if this is unobtainable, give crushed oats, bran, and chaff. Give 1 tablespoon of cod liver oil twice a day for 14 days. If the sight does not improve, consider weaning the foal.

"Taldra" reports 2-year-old steer, unable to walk and has to be hand-fed and watered.

Reply—The symptoms supplied are similar to those exhibited by cattle suffering from "Botulism" (Toxaemia Paralysis). In cattle the disease is usually caused by eating bones which contain the toxin (poison) of a specific microbe. The only additional treatment that can be suggested is giving one of the following powders twice a day for 10 days:—Take strychnine hydrochloride, ½ grain; white sugar sufficient to make one powder; obtain 20. Directions—Dissolve powder in half a cup of water and place in the mouth. To prevent the disease appearing in your other cattle they should be given a mineral mixture during the months when the feed is dry, such as:—Superphosphate and common salt, equal parts; mix thoroughly. This can be fed at the rate of 2ozs. to 4ozs. mixed with chaff and bran at milking time twice a day, or placed out in a kerosene tin cut longways, and placed near the water trough. To make it more palatable, a little molasses can be mixed with it. All bones lying about should be collected and buried deeply, or preferably burned.

"Prospect" asks how should wheat be fed to pigs—whole, crushed, dry or soaked; and what is required to make a well-balanced ration in addition to grain.

Replies—The wheat is best fed coarsely crushed and dry. The ration can be balanced by using either skim milk or meat meal. If the animals are trough-fed, the following proportions of grain and skim milk will provide a balanced ration:—

Age of Pigs.					
1 month	1gall.	milk	to each	2 lbs.	grain.
6 weeks	1 "	"	"	2½ "	"
8 weeks	1 "	"	"	3 "	"
10 weeks	1 "	"	"	3½ "	"
12 weeks	1 "	"	"	4 "	"
14 weeks	1 "	"	"	4½ "	"
16 weeks and over	1 "	"	"	5 "	"

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If the pigs are fed from an automatic feeder, give a drink of milk twice a day in addition to drinking water. If milk is not available, meat meal can be used to balance the ration, as follows:—

Young pigs	12lbs.	meat meal to	100lbs.	grain.
8 weeks old	10 "	"	100 "	"
10 weeks old	9 "	"	100 "	"
12 weeks old	8 "	"	100 "	"
14 weeks old	7 "	"	100 "	"
16 weeks and over	6 "	"	100 "	"

If the pigs can have access to good green pasture or lucerne, the quantities of skim milk or meat meal given could be reduced about half those set out above.

"*Hon. Secretary, Agricultural Bureau, Adelaide*" *asks* (1) *What will remove warts from a cow's teat, and* (2) *What is a good remedy for cow pox?*

Replies—(1) There are various applications which may be used, such as strong glacial acetic acid, lunar caustic, castor oil, strong solution of washing soda, &c. With the exception of lunar caustic, the other reagents may be applied after milking twice a day with a small camel-hair brush (acetic acid and castor oil), or washing the teats in the solutions. Lunar caustic (silver nitrate) can be obtained as a stick, the point of which is slightly moistened and applied to the warts. Where warts have a distinct neck, a ligature of silk can be applied, the wart being allowed to slough off, or else cut off with a sharp penknife. Bleeding can be controlled by applying the lunar caustic pencil lightly. It is often found that the most successful results are obtained by changing the treatment and using the various reagents alternately.

(2) True cow pox is a contagious disease, which, however, usually runs a very mild course, and causes very little disturbance to the affected animal. It has five stages, and unless re-infection occurs, clears up of its own accord in from 15 to 20 days; no treatment will shorten the course. The main essentials, therefore, in treating cases of cow pox is to isolate affected cattle, if practicable, and pay strict attention to cleanliness of affected parts by applying mild antiseptic solutions, such as boracic acid or alum solutions, and then dusting with boracic powder. Zinc ointment can be applied to affected teats after milking.

"*Hon. Secretary, Goode Agricultural Bureau,*" *reports* (1) *cow walks with legs very stiff, and* (2) *mare on good grass in poor condition, coat rough, and skin tight.*

(1) These symptoms in cattle often occur as a result of a deficiency in their diet of minerals (phosphates), more especially occurring among cattle in milk, as lactating animals require large quantities of phosphates to replace that removed in the milk. Such symptoms are more commonly seen as the green feed is replaced by dry feed, as phosphates are present in green feed, but become less in quantity as such feed dries off. Phosphates can, however, be supplied in the form of a lick, mixed with common salt to make it more palatable, and fed either by placing in a receptacle near the water trough, to which cattle can have access at all times, or with chaff and bran at milking time. Any of the following mixtures are suitable:—1. Sweetbone meal (flour) and common salt, equal parts. 2. Dicalcic phosphate, 60 parts; common salt, 40 parts. 3. Superphosphate and common salt, equal parts. If cattle at first refuse to take it, mix in a little treacle. If fed with chaff and bran, give 2 to 4ozs. of the mixture twice a day.

(2) The symptoms of hide-bound indicate debility, of which there are many causes, such as defective teeth, presence of sand, and debilitating diseases, such as influenza, strangles, &c., and internal parasites. It is suggested that the mouth be thoroughly examined for dental defects, such as teeth too sharp on outside edges of upper teeth and inside edge of lower teeth, decayed teeth, and spikes on the back teeth, which prevent grinders coming together. The treatment will depend upon the cause. In any case it will be advisable to give the mare the following drench after fasting for 12 hours:—Take raw linseed oil, 1½pints; oil of turpentine, 4 tablespoonsful. Shake well before administering. From a chemist procure 1lb. of Fowler's solution of arsenic, and give one tablespoonful night and morning in the food until the bottle is finished (16 days), then give another drench of oil. Stable-feed on good hay chaff with 3 to 4lbs. of scalded oats and a little bran.

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ACTIVITIES AT ROSEWORTHY AGRICULTURAL COLLEGE, 1934-35.

PART II.—THE SEASON AND GENERAL HARVEST RESULTS.

[ALLAN R. CALLAGHAN, D.Phil., B.Sc. (Oxon.), B.Sc.Agr. (Syd.), (Principal), and O. BOWDEN, R.D.A. (Farm Superintendent).]

A CONTRAST IN SEASONS.

Every season is different, and unfolds new and valuable experience for the agriculturist; no man on the land can fail to enrich his knowledge and become a more efficient farmer as a result of such annual experiences. If seasons lacked this variability and followed regular well-defined lines then agricultural procedure would be simple, orderly, and alas, monotonous. Fortunately for our psychological outlook the seasons vary with invariable regularity, and thereby emphasise the indispensability of experience in the development of true agricultural sense. Undoubtedly the more closely seasons and their influences are studied and compared, the greater the value is such experience.

The cropping season of 1934 was one of outstanding value in this respect; it was abnormal and out of the ordinary in many ways; it presented seeding and establishment difficulties which threatened failure, and yet gave finishing conditions seldom, if ever, excelled. Usually in the agricultural areas of similar reliability to Roseworthy, the season opens auspiciously with good opening and seeding rains, but finishing conditions are less reliable; consequently the rule is for crops to become well established, show satisfactory growth during the winter, and run into harsh and often quite severe finishing conditions in October. The last season contrasted sharply with these conditions, whereas the 1933 season followed the general rule, except that finishing weather was unusually severe. No two seasons are alike, but seldom do two seasons following offer such marked contrasts as did those of 1933 and 1934.

In 1933 opening rains were good, seeding conditions almost ideal, and winter growth vigorous, with the result that crops were thick, rather sappy, with an inclination to produce more straw than was desirable. This extremely satisfactory beginning was followed by very severe finishing weather in October, when maximum temperatures were high (see Graph 1) and rainfall very low (see Graph 2). The result was that yields in that year were considerably below early estimates.

During 1934, however, absolute reverse conditions held; the opening, although good, was early and received no supporting rains of any consequence making seeding especially worrying, establishment rather uncertain, and with winter rains 4in. below average (see Graph 2) crops were unable to make any growth and were stunted, wilted, and most unpropitious. Well distributed spring rains, with mild and no excessively high temperatures right through until the end of October (see Graph 1) revolutionised the outlook and, although short in straw and lacking in bulk, crops set uniformly with well-filled grain. Results were obtained which exceeded those of the year before, and which were very much above early predictions.

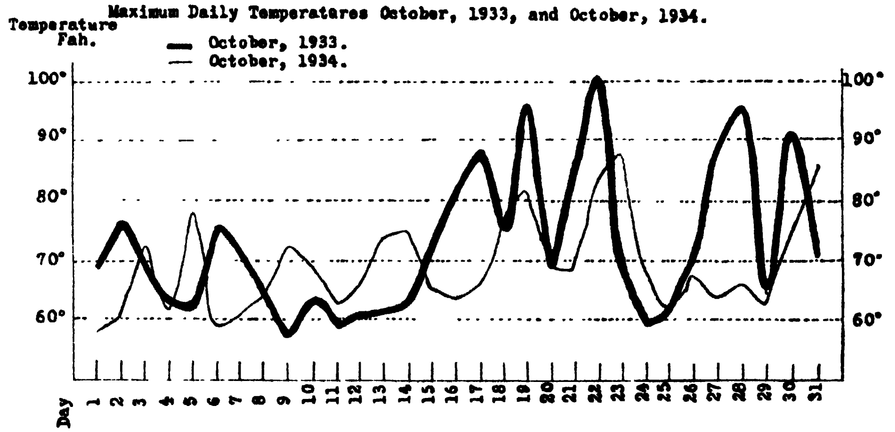
The contrast in finishing conditions of the two seasons is far more obvious when the maximum temperatures for the month of October in each year are considered separately. Reference to Graph No. 3 will indicate how much hotter certain days of October, 1933, were to those of October, 1934, yet the striking thing is that the average daily maximum of 73° Fah. for October, 1933, was only 2.4° Fah. higher than the average daily maximum temperature for October, 1934, which was 70.6° Fah. This is highly significant, and goes to show how dangerous it is to generalise on matters of this nature, and even statistically analysed data based on average temperatures as a guide to the finishing conditions of any season, or set of seasons, may give an entirely misleading result. One hot day with hot, dry, blasting winds from the north may do tremendous damage even though the average maximum temperature for the month remains quite low. Conversely, it is highly probable to have excellent finishing conditions in an October when temperatures are not on any day excessive, but which nevertheless result in a high maximum daily average for the month. Then again, the nature of the preceding weather defines the sappiness or hardiness of the crop, these factors in turn define the ability or otherwise of the crop to stand hot, dry days when finishing.

One can only conclude that, given good finishing conditions, it is extraordinary how crops will make up; conversely, given bad finishing conditions, it is equally extraordinary how poorly otherwise excellently-grown crops will finish.

THE SEASON IN RELATION TO YIELDS.

The summer cultivation of fallows was limited because of low summer rains, especially during January, February, and March. The summer was hot and dry, and reached a climax in this respect with a final burst of unprecedented heat in March. Fallows at the close of summer were consequently dried right out. A heavy rain in December encouraged some germination of weed seeds, and a useful cultivation was possible; following this, however, the fallows remained undisturbed until good opening rains fell in April, when 2.09in. were recorded. Although this compared more than favourably with the average for April of 1.45in., the rainfall for the first four months of the year was half that normally received for the same period. The most of the April rain fell during a heavy storm, and this following the dry summer was certainly more useful than a lighter fall would have been, for the effect was to consolidate the fallows; seasonal conditions prior to this heavy rain had not been helpful in this regard, and fallows were inclined to be open.

Roseworthy Agricultural College.



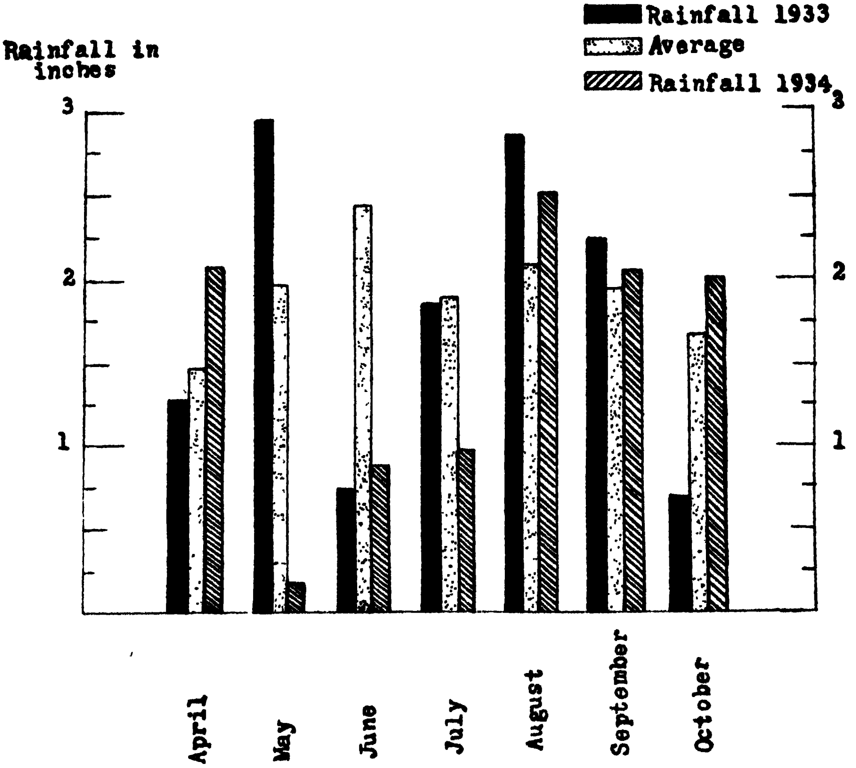
GRAPH No. 1.—Depicting the corresponding daily maximum temperatures for October of the years 1933 and 1934. Finishing conditions in 1933 were severe; those of 1934 were very favourable.

Unfortunately, the auspicious opening relished in April was followed by unusually dry conditions, and a mere 19 points were recorded for May. As a result of this setback it was difficult to know what to do for the best; seeding which had proceeded with great confidence became very precarious, and on the

9th May drilling was stopped. June and July recordings were very much below average and full of disappointment, so much so that a pessimistic outlook began to threaten even the most optimistic temperaments. By the end of July the total rainfall for the first seven months of the year was only 5.22in.; the average for the same period stands at 9.90in.

The following shows the relationship of the season under review to the end of July with similar low rainfall years over the past 31 years with regard to rainfall:—

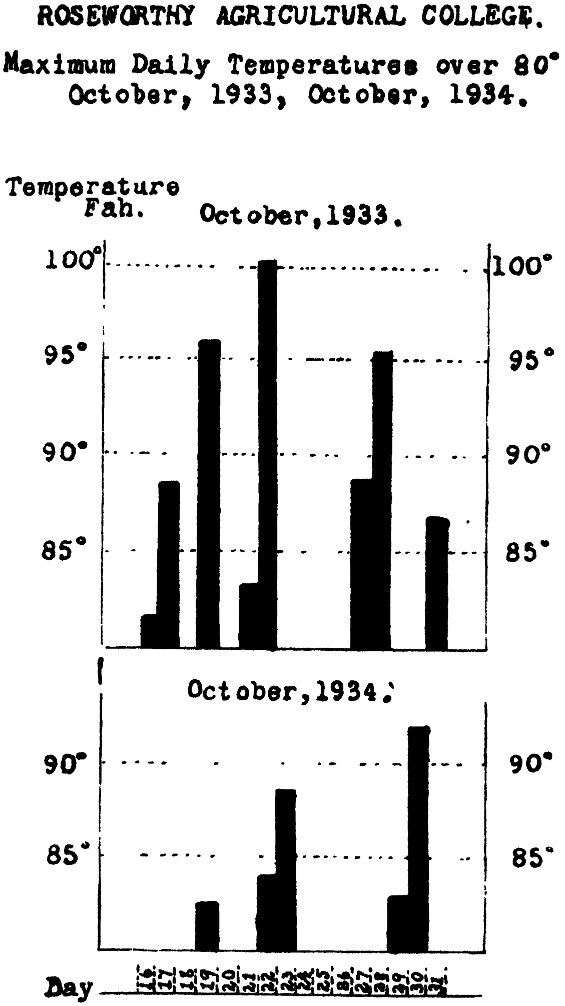
Year.	Rainfall for Seven Months, January–July. Inches.	Total Rainfall. Inches.
1929	4.78	13.06
1913	5.21	15.66
1934	5.22	14.38
1930	5.23	12.87
1912	5.65	14.97
1919	6.24	12.38
1914	6.71	9.36
1918	7.34	12.01



GRAPH No. 2.—Portraying in graphic form Seasonal Rainfall, April to October (inclusive), for the years 1933 and 1934, compared with the average rainfall for the same period.

Seeding progressed intermittently following the occasional rains, and under the prevailing circumstances reasonably good establishment of the crops took place, but they suffered severely under the subsequent dry conditions. The early-sown crops showed a decided tendency at this stage to spindle, and all crops thinned out appreciably.

With August came a complete transformation; following good rains the whole outlook altered and by the close of the month prospects were 200 per cent. better than they were at the end of July. The recovery was astonishing, and many crops that appeared to have no hope of revival at the end of July, were in a healthy, vigorous state by the end of August, with every promise of doing well. One cannot help but be impressed, after such experience, with the hardiness and recuperative capabilities of the young wheat plant. At one stage some of the College crops were so dry that leaves of the young plants were almost brittle, yet these crops revived in most spectacular fashion, those referred to subsequently yielding 25bush. or over per acre.



GRAPH No. 3.—Days of extreme heat in October, 1933, compared with those experienced in 1934. Although average temperatures for October, 1933, and October, 1934, compare favourably, much more extreme heat was experienced in 1933. It was the very hot days of this month, which were the chief contributory causes to the sudden and severe finishing of cereal crops.

Until the relief rains of August were received crops were merely subsisting on surface soil moisture provided at long intervals by the few isolated showers received. Normally there is sufficient subsoil moisture to assure the completion of the life-cycle of the plant with normal rainfall in the spring, but last season, with no subsoil moisture available it became patent that substantial falls of rain and cool weather were essential, at least until the end of October, if anything like a normal crop was to be garnered. It was realised that a dry spell in the spring could not be other than disastrous. The one chance was realised, for the August rains were followed by equally useful falls in September and October, and during the latter months mild, excellent finishing temperatures prevailed.

Distribution of Rainfall at Roseworthy College for the Past Six Years and for the Years 1909 *and* 1920.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1909	0·75	0·28	1·17	1·91	2·89	1·84	3·80	4·56	1·52	2·55	2·08	0·70	24·05
1920	0·27	0·00	0·86	0·69	1·47	4·44	1·12	3·01	1·62	2·53	1·88	1·41	19·30
1929	0·29	0·36	0·17	0·42	0·93	1·54	1·07	1·62	1·90	0·76	1·49	2·51	13·06
1930	0·02	0·30	0·01	0·89	0·74	0·77	2·50	2·06	1·03	3·21	0·59	0·75	12·87
1931	0·60	0·10	1·01	1·05	2·80	1·70	2·51	1·86	2·25	0·83	0·47	0·00	15·18
1932	0·34	1·24	1 27	3·73	1·91	3·83	1·73	1·95	1·29	2·73	0·11	0·90	21·03
1933	0·99	0·01	0·94	1·29	2·99	0·74	1·84	2·84	2·24	0·67	0·29	2·01	16·85
1934	0·39	0·14	0·54	2·09	0·19	0·89	0·98	2·49	2·69	2·00	1·65	0·33	14·38
Mean for period 1904-1934	0·65	0·71	0·85	1·09	2·13	2·21	1·94	2·06	2·04	1·75	1·05	0·89	17·37

So that in spite of the gloomy outlook that threatened the crop horizon in July, the yields from College crops were exceptionally good. At first it was thought the College record for wheat yield per acre had been broken with an average of 26bush. 57lbs. from an area of 407 acres, but curiously enough this average yield was exactly equal to the record yield obtained in 1920 when 26bush. 57lbs. per acre were obtained from an area of 340 acres. That year, however, a rainfall of 19.30in., which was well above the average, was enjoyed, and rainfall during the growing period, April-October, was very high at 14.88in., actually exceeding the rainfall for the whole 12 months of 1934. The total recordings for 1934 were 14.38in., which was more than 3in. below the average, and the rainfall for the growing period of the crops, April-October inclusive, was 11.33in., whereas the average for this period is 2in. higher.

The bushel yield obtained per inch of seasonal rainfall was a College record, easily breaking that set up in 1933, and in this respect the following table shows the position clearly:—

Comparison of Average Yield of Wheat with Seasonal Rainfall for Previous Good Years.

Year.	Total Rainfall. Inches.	April–October Rainfall. Inches.	Average Yield Per Acre. bush.	lbs.	Yield Per Inch of Seasonal Rainfall. bush.	lbs.
1909	24.05	19.07	25	5	1	19
1920	19.30	14.88	26	57	1	49
1929	13.06	8.24	15	11	1	51
1933	16.85	12.61	24	51	1	58
1934	14.38	11.33	26	57	2	22

This result needs no apology but it is only fair to mention that the handling of stud and pedigree strips with strippers in accordance with the new pure seed policy, had a definitely depressing effect on yields. Apart from the loss in handling with strippers and winnowers, these sections of the crops were walked through several times and rigorously rogued. Excluding areas so treated, the average return per acre from the main crop areas was 27bush. 26lbs.

For the sake of maintaining general comparisons with other State data, the following summarised information is tabulated based on "useful" rainfall as used to describe the April-November recordings by the State Statist:—

Wheat Yields at Roseworthy College Compared with Average District Yields for the Year 1934.

District.	April–November Rainfall. Inches.	Average Bushel Yield Per Acre. Inches.
Whole State (agricultural areas only)	11.97	8.61
Central	15.57	13.17
Roseworthy College	**12.96**	**26.95**
Lower North	11.92	14.49
Upper North	8.28	7.44
South-Eastern	20.13	19.61
Western	9.61	4.25
Murray Mallee	10.11	4.92
Roseworthy College, mean for 31 seasons (1904-34)	14.24	17.45

The work on the College Farm is done by students. The photograph shows a student leaving the stables with his team. Note the reserves of hay in the hay shed.

WHEAT.

In preparing the fallows in 1933 the ploughing depth of 3in. was maintained; all ploughing was finished early in August. Fields were harrowed down and cultivated with the rigid-tyne cultivator; this initial cultivation was completed early in October, and fallows were then in bright, clean condition. The summer was unusually dry, and no general cultivations were carried out until after the heavy rains of December, 1933. Following this, all fallows were cultivated either in late December or early January, spring-tyne implements being used for the purpose. February and March were exceedingly hot and dry, so that prior to the opening rains of April, fallows, although in good condition, were bone dry. Pre-seeding cultivations were carried out after the opening rains with rigid-tyne cultivators and combines according to requirements and the dates of seeding. At seeding the fallows were in excellent tilth.

Seeding was begun at the end of April, and proceeded happily until the dry conditions experienced in May made it precarious to continue. The varieties Ford, Nabawa, and Sword were all sown before the 9th May, when drilling was suspended for a period of two weeks. Of these, Ford made best growth, although establishment was not as uniform and even as in normal seeding years. Soursobs competed very severely with Sword and Nabawa. Germination was uneven and irregular, being delayed considerably on heavier areas of soil, but subsoil moisture was sufficiently plentiful to encourage the germination of myriads of soursob bulbs, the young shoots from which pushed their way audaciously from low levels. With the deep start in the rooting system the soursobs took full advantage of the uneven, thin stands of debilitated wheat plants, soon to form a regular mat over the surface in many places. Naturally, this unexpected competition played havoc with the crops, draining the sparse moisture supply from the roots of the plants, and smothering the seedlings overground. The effect was so damaging over one area of the Nabawa sown in Georges that in desperation 23 acres of this paddock were temporarily fenced, grazed out, and resown late in July to the early-maturing variety Canberra. Had it not been for rust this drastic step would have been eminently successful as the Canberra made up quite well, but, maturing late in the season, it took rust badly, and yielded well below the average of the remainder of the paddock.

Seeding of the remaining crops, after the fortnight's delay in May, did not proceed regularly as advantage had to be taken of occasional light rains. This rather spasmodic seeding was necessary, and by carrying on only when sufficient moisture was considered to be present, satisfactory germination and establishment were obtained in all these later-sown crops.

Considering the difficulties of seeding and the extreme dryness of the winter the ultimate yields obtained were really very satisfactory. Some quite notable yields were obtained as will be seen from the tabulated results below; chief of these was from Ranee 4H, 35bush. 43lbs. per acre, and from the old College variety, King's White, 33bush. 4lbs. per acre. The latter was taken off paddock No. 16, which is a field of limestone rubble. The crops which suffered most severely were those sown early following the openings rains of April; they had a particularly severe time in the early life of the plants, all of which was reflected in their ultimate yields, but outstanding in these early-sown areas were the College varieties Sword and Ford. Their general vigour and hardiness helped them survive the gruelling setback in May, June, and July, to return the excellent figures of just over 25bush. per acre in both cases.

ROSEWORTHY AGRICULTURAL COLLEGE.

Wheat Yields from Farm Areas, 1934.

(a) Varieties of which at least 10 Acres were Harvested for Grain.

Variety.	Field.	Area in Acres.	Yield Per Acre.	
			bush.	lbs.
Ranee 4H	Crouch's D	55	35	43
King's White	No. 16	38	33	4
Waratah	Grainger's B	46	30	19
Sword	Nottle's B	72	25	37
Sultan	No. 7 B	16	25	14
Ford	Flett's A	50	25	3
Nabawa	George's	76	23	9
Canberra	George's (re-seeded portion)	23	12	3

(*b*) *Varieties of which less than* 10 *Acres were Harvested for Grain.*

Variety.	Field.	Area in Acres.	Yield Per Acre. bush.	lbs.
Nawab	No. 6 D	5	29	3
Gluyas	No. 6 D	2	29	1
Waratah	Daly's B	9	26	40
Dundee	No. 6 D	8	26	27
Baringa	No. 6 D	5	25	54
Currawa	No. 6 D	1	23	17
Florence	No. 6 D	1	22	29
Felix	No. 6 D	½	22	2
Sirdar	No. 6 D	¼	20	26

A glance over the varieties sown to any extent on the College areas will indicate that the number of varieties has been considerably reduced of late years. Ranee 4H, a comparatively new wheat to our large farm areas, seems to suit conditions admirably, as in 1933, on a small area, a yield of 35bush. 25lbs. was obtained, and this, followed again by the yield last season of over 35bush., makes one confident of the worth of the variety under these conditions. The variety, King's White, has been actually resurrected, and in the last two seasons it has justified its re-introduction. Fashions change in varieties, and it is significant that in most localities other early-maturing varieties have largely replaced King's White.

Initial working in the preparation of fallows is done with skeleton mouldboard ploughs. The normal ploughing depth is 3in.

Early College records indicate invariably the success of this old variety, and for this reason new loves were discarded to take on the old by way of experiment. It appears from results obtained that there is no very early-maturing variety that suits College conditions so well as King's White; the fact that it is one of the oldest varieties should not be sufficient reason for despising it.

Waratah is an excellent yielding variety, but unfortunately it is not considered satisfactory in baking quality, consequently it has since been deleted from the College farm areas. The two varieties Sword and Ford have again proved themselves worthy of continued attention; fortunately Ford is ranked fairly high for its baking quality. The College has rendered excellent service to the State, and even to Australia as a whole, in breeding these two varieties. Another College wheat of more recent origin is Nawab, and its yield of nearly 30bush. calls for notice, though more extensive experience is required with the variety before recommending it. This also applies to Dundee and Baringa, two New South

Wales wheats, but as they are noted for baking quality one is inclined to voice an opinion early and suggest that both wheats are at least worthy of trial in many areas of the State.

HAY HARVEST.

The nature of the season was such that stands were thin and crops short and generally lacking bulk, so that only light yields of hay were possible. The position is exaggerated when it is remembered that the hay was cut from headlands, which suffered more severely than the main portions of crops, especially as trees had very marked marginal effects last season. The best result for the year was obtained with Waratah, which yielded over 2 tons per acre from 24 acres, which, for the season was very good. The yields obtained are tabulated in the following table:—

Hay Yields, 1934.

Variety.	Field.	Area Harvested, in Acres.	Yield Per Acre.		
			tons.	cwts.	lbs.
Waratah	Daly's B	24	2	3	14
Ranee 4H	Crouch's B	8	1	19	77
Sword	Nottle's B	7	1	16	14
Sultan	No. 7 B	6	1	15	90
Waratah	Grainger's B	5	1	15	37
Miscellaneous Varieties	No. 6 D	14	1	14	7
King's White	No. 16	10	1	9	63
Sword	No. 3 B	14	1	6	97
Nabawa and Canberra	George's	11	1	1	13

STUBBLE CROPS.

The preparation of stubble land for seeding to oats, peas, and barley was begun immediately after the opening rains in April when the skim ploughs and cultivators were able to work well. The only stubble field not given routine preparation was that known as Ebsary's; in this case a light seeding of oats with 1cwt. of superphosphate was combined straight over the stubble two days before the rain fell. This paddock was known to be badly infested with wild oats, and it was decided to combine about 20lbs. of oats straight in with the idea of utilising the paddock for grazing and later, if necessary, cutting it for silage.

Oats.—The paddock Day's C. was skim-ploughed during April, and by 2nd May had been fully seeded to oats and harrowed. This field was seeded in ideal condition for stubble land, and under normal seasonal conditions would undoubtedly have given good results. The season, however, was definitely unfavourable to early seeding, for no rain was received to keep up the moisture supply to the germinating seed, and the young oat plants, soon after appearing above ground level, were checked and stunted in growth, due to lack of moisture. From the depths came the notorious soursobs, and, finding the oat plants too debilitated to compete successfully, they soon took possession of large areas of the field. Wild oats, also coming from deeper levels in the soil, grew more vigorously than the sown crop. When the position was relieved by rains in August the competition from soursobs and wild oats, though virtually over, had had a very telling effect on the crop, which made rather disappointing growth. In spite of the fact that the previous year's wheat crop on this paddock had been comparatively clean, a very heavy infestation of wild oats now presented itself in the crop, and made it useless for pure seed purposes. Rather than have the wild oats seed and fall, the whole paddock was cut for silage early in September. The yield was light at a little over 2 tons per acre, but soon after cutting good rains fell, and an unusually even second growth followed and finished sufficiently well to enable the harvesters to gather a little more than 4 bushels per acre, and thus save the lines of pure seed of all the oat varieties grown therein.

The experience gained as a result of the year's work in this paddock pointed directly to the futility of attempting to raise pure seed oats on other than fallowed land where wild oats are known to be present. The experience also left the oat storage bins low in reserves, a fact which forced a full realisation of the importance of assuring a good crop of oats. Oats in the fodder reserves are indispensable, and no risks should be run of failure with the crop on any property where livestock are featured to the extent they are at the College. The moral is that where one is farming for livestock it will pay to grow oats on fallow. In this way, sown early, good grazing value can be obtained in normal seasons, and the crop is assured, whereas, on stubble land, there is always a risk of low yields and comparative failure. Livestock and their proper feeding are too important on the farm these days to neglect, and there is no doubt that oats will help very largely to safeguard this asset, and for this reason, as a crop it should be given every advantage on the farm. In future, therefore, College policy is to grow more than half the oats on fallowed, rather than stubble, land. Then again, all oats intended for pure seed will of necessity be grown in future on fallowed land.

Three plough teams at work preparing fallow in Day's A and B, July, 1934.

Oats for Grazing.—As stated in the opening remarks in connection with stubble crops, the field Ebsary's, 57 acres in area, was combined straight in with 20lbs. Oats and 1cwt. superphosphate. The field was under wheat the previous year, and was harvested for hay and grain. It was known to be heavily infested with wild oats. After a good stubble burn the combine was run over the paddock, and, luckily, two days later good rains fell, and an exceptionally heavy germination of wild oats followed, together with the sown seed.

Actually the treatment of the paddock was designed, firstly, to encourage the germination of wild oats, and, secondly, to make some economic use of the wild oats once established. The burning-off of stubble, the stirring of the surface soil only, and the dressing of superphosphate, were all factors conducive to ready germination of wild oat seeds fallen from the infested crop of the previous season. The seeding of 20lbs. oats was meant merely to supplement the germination of wild oats expected and to make sure of a covering on clean areas. The fodder made excellent growth, and with natural pasture fields making no headway, as a result of the poor winter conditions, it was of outstanding importance as it provided the necessary feed of the right type for the ewes and lambs, which, by then, were badly in need of good pasturage. A large proportion of the early lambs from College last year were marketed from this field, and for this reason an attempt to assess its economic value has been made. One hundred and forty-one ewes with 156 lambs at foot, and which were then from five to ten weeks old, were turned into the paddock on 29th June, and they remained there until 15th August. By then 105 lambs had been sold. Following this the paddock was grazed right out.

Sheep Carried on Ebsary's (58 Acres).—Sown to Oats for Green Feed, 1934.

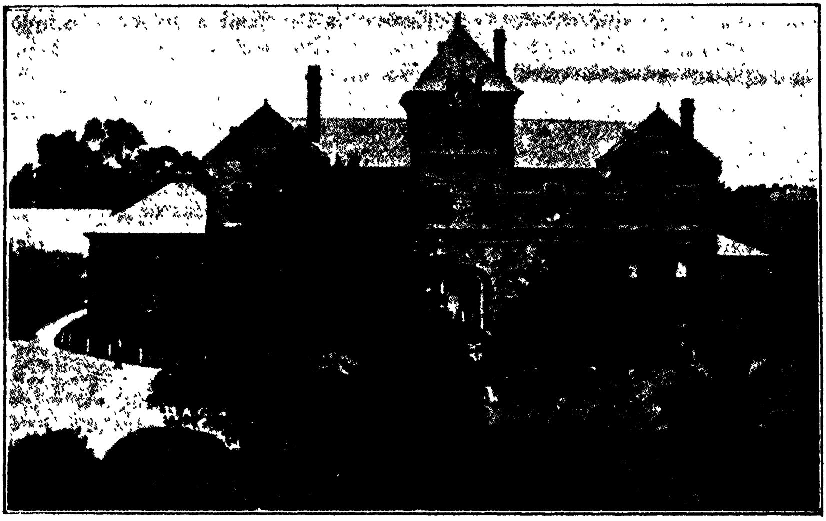
Period.	Mature Sheep.	Suckling Lambs.
29th June–15th August	141 ewes	156 lambs
20th August–24th August	165 dry sheep	
25th August–2nd September	211 dry sheep	
3rd September–18th September	211 dry sheep 145 ewes	43 lambs
21st September–2nd October	172 dry sheep	

From this some guide, even though it may not be strictly accurate, can be obtained as to the value of the field to the College. The lambs were, at the time of going into the field, wholly dependent on their mothers, and for the purposes of valuation at least three-quarters of the finished value may legitimately be credited to the paddock. On this basis lamb returns can be arrived at. To value now the agistment for adult sheep, taking into account (*a*) the nature of the season with the shortage of natural feed throughout the State, and (*b*) the fact that the greatest proportion of adult sheep carried were wet ewes, a very reasonable valuation of agistment is 3d. per head per week.

Estimated Sheep Returns Obtained from Ebsary's (57 Acres).—Sown to Oats for Greenfeed, 1934.

	Gross Returns. £	s.	d.	Direct Net Returns Credited to the Field. £	s.	d.
104 lambs sold from field	69	15	0			
35 lambs sold 14 days after leaving the field	26	14	0			
17 lambs remained on farm after leaving the field; valued at	11	18	0			
Total returns from lambs	108	7	0			
Less freight, commission, &c.	10	8	0			
Total net return from lambs	97	19	0			
Of this at least three-quarters may be directly credited to the field (£97 19s. x ¾)				73	9	3
Equivalent 129 dry sheep for 11 weeks at 3d. per head per week				17	14	9
Total sheep returns				91	4	0
Less estimated costs, superphosphate, seed, labour, horses, and plant				25	3	9
Total net return from 57 acres (April-October)				£66	0	3

Only comparatively poor growth and recovery was possible in such a year, and under the circumstances returns were satisfactory, but in good seasons such an area should carry greater numbers and give returns a good deal more attractive. This raises an interesting point, and emphasises the value of oats as a grazing proposition. It presents a line of development well worth more extensive exploitation, especially on farms and in districts where natural pastures following a year of cropping do not make up well. The subsequent treatment of the paddock is therefore a matter of interest. In October it was ploughed and treated as fallow, and in 1935 it is to be sown late to barley.



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Barley.—Barley yields were above average; the season, being late, with good finishing weather, was very suitable for the crop. Sown late the barley had not to contend with the dry weather experienced earlier, and a splendid sample of grain was harvested, with an average return of 32bush. 22lbs. per acre. The following table indicates the yields obtained:—

Barley Yields from Farm Areas, 1934.

Variety.	Field.	Area in Acres.	Yield Per Acre. bush.	lbs.
Prior	Grainger's C	12	36	43
Tunisian	Grainger's C	3	32	42
Californian Cape	Grainger's C	6	32	3
Roseworthy Oregon	Grainger's C	12	30	17
Shorthead	Grainger's C	6	26	2

Peas.—The value of this crop on the farm is not fully realised. Apart altogether from direct returns, the crop is a valuable one in any rotational system for it thrives on land low in nitrogen and rich in phosphate, and having matured on the field enriches it in nitrogen as a result of nitrogen fixation. This, with the feeding off of haulms and droppings from stock has a very appreciable influence for good on the soil, raising the levels of both nitrogen and organic matter.

The position the crop has been given in the College rotation-system has already been discussed. Last year, in the field Crouch's C, 82 acres were sown to peas, on wheat stubble, at the rate of 2bush. of seed per acre and 1½cwts. superphosphate. The early-maturing variety White Brunswick was sown through the combine on well-prepared land early in June; following seeding the field was culti-packed. The crop established well, although a little thin, and was quite even and attractive. In December it was taken off with a header with a false comb attachment, and gave a yield of 14bush. 34lbs. per acre. A lot of grain was lost due to splitting of the pods as a result of delayed harvest, the latter being unavoidable because of annual weed growth that came profusely in the crop after the spring rains. The grazing obtained subsequently utilised all this lost grain, and as the results are instructive the returns are tabulated below:—

Gross Returns from Crouch's C (82 acres).—Sown to Peas, 1934.

Value of Grain Harvested.	£	s.	d.
14½bush. per acre from 82 acres gives a total yield of 1,189bush., valued at 4s. per bushel	237	16	0

Value of Stubble Grazing.

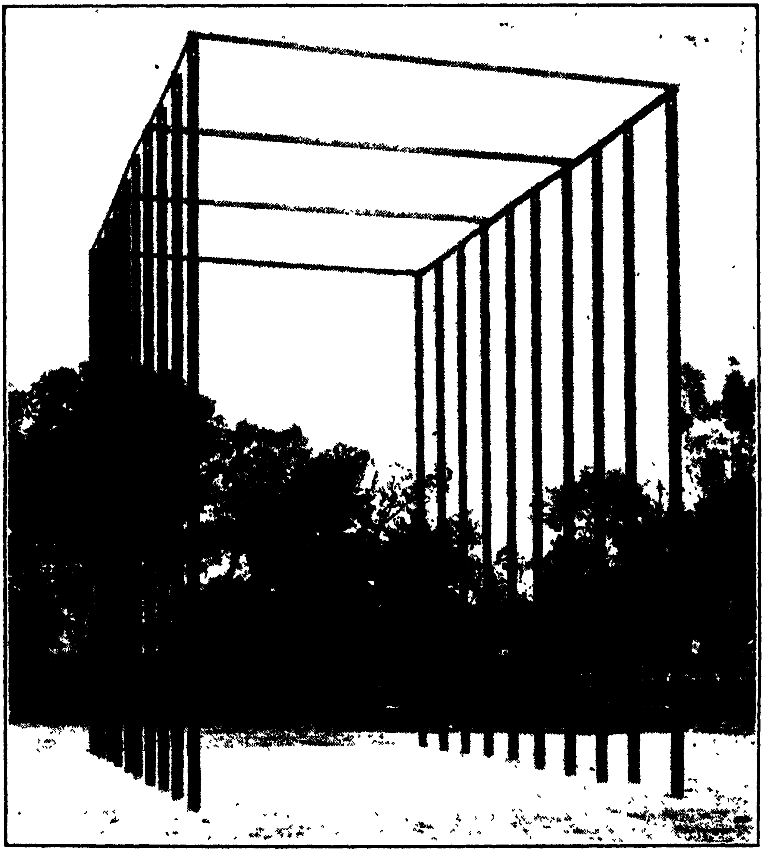
Period of Grazing.	Basis of Valuation.	Agistment Returns. £	s.	d.
22nd December–13th January	108 sheep for three weeks at 3d. per head per week	4	1	0
14th January–24th February	436 sheep for six weeks at 3d. per head per week	32	14	0
25th February–10th April	299 sheep for six weeks at 1½d. per head per week (paddock feed supplemented by some hand-feeding)	11	4	3

	£	s.	d.
Total estimated grazing value	47	19	3
Gross returns	£285	15	3

It was extraordinary how well the sheep did on this pea stubble, and it is from this field that some late carry-over lambs were fattened and marketed. The estimates given above of the agistment values are based on records kept of the stocking on the paddock between the time of harvesting the peas in December and cultivating the paddock immediately after rain opened the season in April.

SILAGE HARVEST.

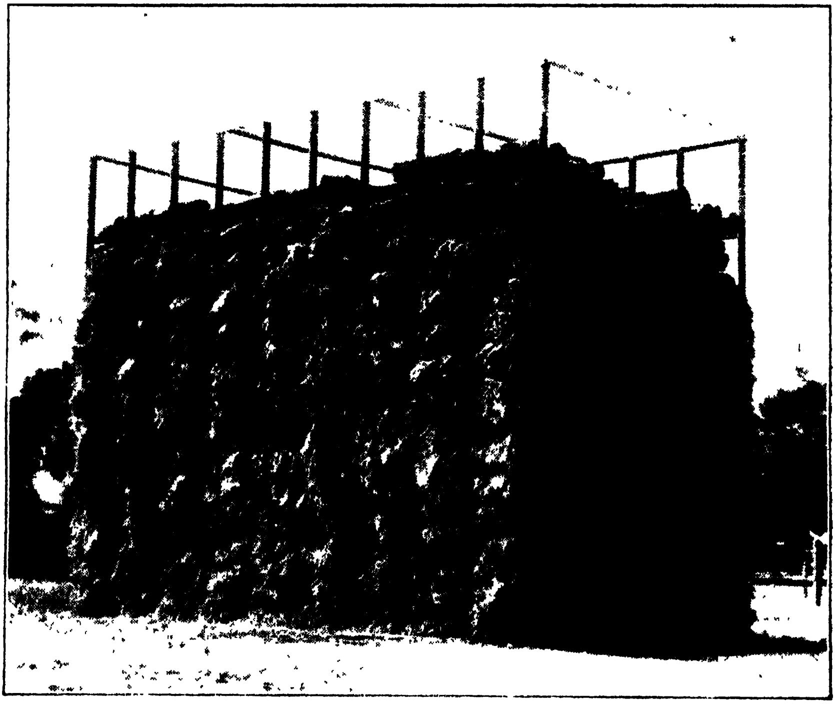
The year was one in which inroads were made on reserves carried over from good seasons rather than one in which reserves were built up. Consequently, only normal yearly requirements were handled for silage. In fact, everything possible was utilised, but after summating the whole of the silage harvest it was found that only 356 tons of green fodder had been ensiled. This was taken from the oats sown in Day's C, and already referred to, and some from headlands. The latter was taken to finish off the pole-guided stack. This one stack of 149 tons was made in addition to filling the one overhead silo which was empty, and re-topping a small, empty portion of the other overhead silo. To refill the empty portions of the two overhead silos 207 tons of green fodder were ensiled.



For handling Sheaved Cereal Fodder, this type of pole-guided silage stack has been found very efficient at the College. A permanent framework of railway irons has now been erected. The illustration shows a "stack frame," 27ft. x 14ft. 6in

No self-sown fodder was available, as paddock feed was extremely short; in fact, heavy feeding to cattle and horses from the reserves was necessary during the winter months, whereas ordinarily an abundance of paddock feed is available during this period of the year.

The pole-guided stack, made last year, was built in a permanent framework. Full details of this method were given in the report for last year (*Journal of Agriculture,* September, 1934). The method was so successful for sheaved cereal fodder that by way of a permanent demonstration the wooden poles used the two previous seasons were replaced by railway irons braced at the top with a cradle of angle iron. This structure is shown in the illustrations. It represents a cheap but permanent stack silo frame and an outline of the construction, with details of all costs, will be of interest.



The framework filled with Green Cereal Fodder and weighted down. It was filled to the top twice, and the third time was stacked above the top about 3ft. It subsequently settled about another 2ft. lower than shown in this photograph.

A framework to hold from 170 to 190 tons of green fodder was required, and a base of 27ft. x 14ft. 6in. was selected. This is small, but it is a very wise plan to keep the base small in all silage stacks, and make up for it by going high, thus making greater use of the weight of the fodder itself. Ten rails placed 3ft. apart were required on each side to give the base length of 27ft., and the two lines of poles were placed 14ft. 6in. apart, giving this width to the stack.

For the purpose, 50lb. railway reject rails 27ft. long were purchased. Being reject irons it was thought advisable to safeguard against possible flaws in the rails at ground level, where the outward strain would be concentrated; this was done by bolting 2in. x ⅜in. side plates along each side of the irons. These plates were 3ft. in length and 18in. above ground level and 18in. below.

The site of each pole was carefully located, and a hole of 5in. diameter was sunk with a borer to a depth of approximately 5ft. The depth varied slightly because of the irregularity in length of the irons, all of which had, of course, to be measured and marked to make sure of an even 22ft. above ground level. The small hole of 5in. diameter necessitated the use of only a small quantity of cement to set each rail, but being so small dead accuracy was necessary, as no side movement was possible for lining up. After cementing the rails into position they were left for a week before the angle-iron cradle was attached to the top. For the latter purpose 2½in. x ⅜in. angle iron was used. This angle iron was bolted to each rail at the top along both sides, and each opposite pair of end rails were connected. Two similar strands of angle iron connected across the top joining two opposing rails in each case. Actually this entailed the construction of an angle-iron frame to add rigidity to the rails, the cradle or frame, being rectangular, 27ft. x 14ft. 6ins., with two supporting cross pieces running through the rectangle 9ft. from each end. The illustrations given herein make this ponderous description quite clear.

The costs are summated below, based on accurate records:—

Roseworthy Agricultural College, 1934.—*Costs of Framework of Railway Irons for Pole-guided Silage Stack to Hold* 170-190 *Tons Green Fodder.*

	£ s. d.	£ s. d.
Material—		
20 railway reject rails 27ft. long at 11d. per foot	24 15 0	
15¾cwts. angle iron and flat steel	14 4 0	
Bolts and sundry fittings	1 0 0	
Boring two ⅝in. holes in rails	2 0 0	
Three bags of cement	0 18 0	
Railway freight	3 7 6	
Total cost of materials		46 4 6
Labour—	£ s. d.	
One man at 10s. 6d. per day for five days	2 12 6	
Four students at 5s. 3d. per day for five days	5 5 0	
Total cost for labour		7 17 6
Grand total cost of framework		£54 2 0

Another framework of similar character is being erected this year adjoining the first, and one, at least, will always be full. Being permanent they will offer a valuable demonstration to any visitors interested in this method of conserving fodder.

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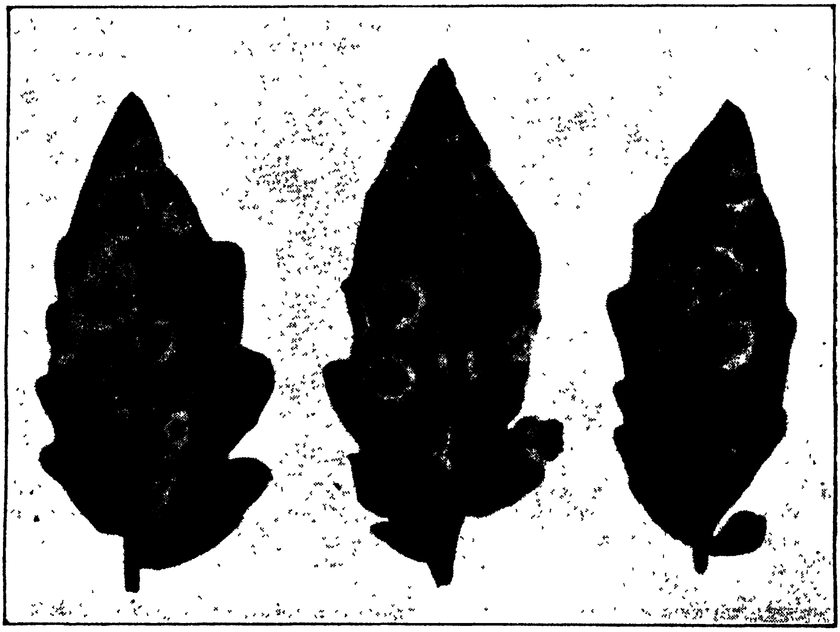
LEAF MOULD: A DISEASE OF GLASSHOUSE-GROWN TOMATOES.

[By D. B. ADAM, B.Agr.Sc., Waite Agricultural Research Institute, University of Adelaide.]

Leaf mould (*Cladosporium fulvum*) unfortunately has made its appearance in commercial crops of glasshouse tomatoes growing in this State.

This disease was reported to have occurred in New South Wales in 1933, apparently for the first time (^{1}), and was recorded as occurring in Victoria in 1934 (^{2}). The current outbreak appears to be the first time that the disease has been observed in South Australia.

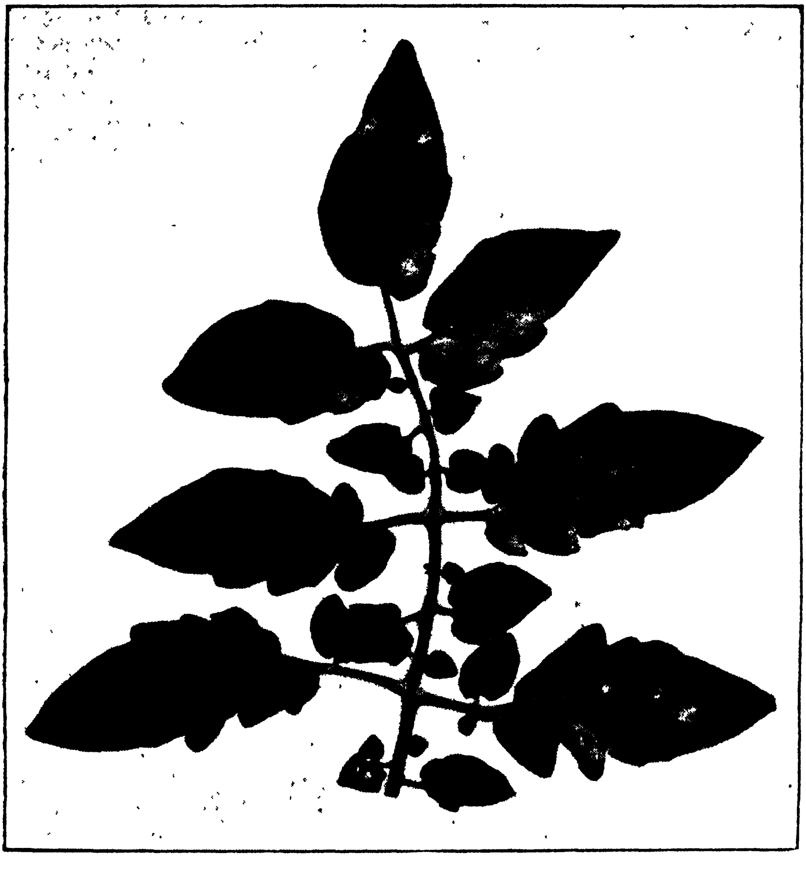
Leaf mould is one of the commonest diseases of tomatoes grown under glass in other parts of the world. It is well known in England and other parts of Europe, in the United States of America, Rhodesia and New Zealand. Indeed, until recently, Australia appears to have been the only considerable area free from this disease. It is impossible to say how leaf mould was introduced into this State. Apparently it must either have been freshly introduced from abroad or from New South Wales or Victoria. If, as seems likely, the fungus came from a neighbouring State the local outbreak illustrates how rapidly plant disease of the nature of leaf mould may spread from State to State, despite the considerable distances apart of centres of production, and despite some restriction on the inward movement of tomatoes. The occurrence of leaf mould in this State by whichever means it was introduced, serves also to emphasise how important and onerous are the responsibilities of the Commonwealth Health Department, the only body capable of exercising in all States the powers necessary to prevent the introduction of a plant disease from abroad.



Lower Surface of Tomato Leaflets, showing Leaf Mould.

It is not yet possible to say how important a factor in glasshouse tomato production leaf mould may become, but it can be said that this disease has proved to be very troublesome in many different centres of production and under a variety of climates, and there is no reason to expect that it will not, at times, prove troublesome here.

In the following account of the disease, reference is made to the first observations of the disease here, its symptoms and the problem of its control. The information concerning control measures is derived largely from English sources especially from the results of the work of Small (3,4) who conducted his extensive investigations at the Experimental and Research Station, Cheshunt, Herts., England.



Upper Surface of Tomato Leaf Affected by Leaf Mould.
[*Photos. by A. D. Cocks.*]

OBSERVATIONS ON THE LOCAL OUTBREAK OF LEAF MOULD.

Tomato leaf mould was first definitely identified from specimens brought to the Waite Institute on 11th October, 1935. The grower in whose glasshouse the disease occurred stated that he had first noticed the disease about three weeks previously. At the time of his visit the disease was established in four houses and present in forty others. A survey of tomato houses in the Adelaide district was arranged for immediately by the Chief Horticultural Instructor and evidence of the presence of the disease found in glasshouses over quite a large area to the west and south of Adelaide; from the closer in areas at Lockleys and Underdale to Morphettville and Glenelg.

There are grounds for believing that the disease was present earlier in the season but that its development had been restricted, possibly because of unfavourable temperature conditions. At the beginning of August, after a short spell of warm weather, a number of independent inquiries were received from growers over quite a wide area concerning a leaf disease of tomatoes. On making an examination in the affected houses it was observed that over small areas the plants had occasional pallid spots on the leaflets, sometimes in their centres but more frequently at their edges. The spots were quite small and were drying out and in themselves appeared to be unimportant. These leaves were examined microscopically for evidence of the leaf mould fungus but with the exception of one leaflet on which a small diseased spot occurred, nothing definite could be ascertained from the examination. The diseased leaflet was the only one affected in this way that could be found in a large glasshouse in which the plants were nearly full grown and from which several pickings of fruit had been made. Although the spot on the leaflet lacked some of the characteristic features of leaf mould, the microscopic features of the fungus associated with these spots corresponded so closely with that of the fungus known to cause leaf mould that steps were taken to inoculate healthy plants to see if the disease could be reproduced. These early attempts failed, possibly because of the comparatively low air temperatures that prevailed in the glasshouse during the course of the experiment

THE SYMPTOMS OF THE DISEASE.

In the group of houses where the disease was first observed, it was noticed that the disease was worst in the houses first planted (*i.e.* planted in early May as compared with others planted in June) and in those having metal rather than wooden rafters. It is possible that the use of metal rafters created more favourable temperature conditions within the house for the disease, although no exact information on this point has been gathered. The disease affects the leaves principally, particularly the lower, older ones. It may also affect flower trusses, causing them to wither and to fail in setting fruit. On well grown fruit it may affect the persisting sepals but infection of fully grown fruit, which appears to be a rare form of the disease, has not been observed.

Whether the first symptoms on the leaves appear on the upper or lower surface of the leaf depends on weather factors during the course of the development of the disease. Most usually they occur on the under surface of the leaf where there develops a velvety, greyish-white patch, the centre of which soon acquires a more olive green colour (*see* illustration). Almost simultaneously with the development of this mould patch on the under surface of the leaf, diffuse pallid spots appear on the upper surface, the discolouration becoming more intense with age.

Under favourable conditions the diseased patches may extend and ultimately coalesce to involve the whole leaflet. These leaflets become covered with very dense masses of powdery spores which acquire a purplish colour as the leaflet dies. Shaking these affected leaves results in masses of spores dispersing in great clouds. The effect of the disease on the plant as a whole depends on the extent to which the leaf area is reduced. In its severer forms the disease is seldom the direct cause of the death of affected plants but the fruit, ripening prematurely, may be small and the total production of the plant considerably curtailed. Leaf mould is primarily a disease of glasshouse tomatoes. It may occur on plants grown outside but every indication points to the likelihood of its being of no economic importance to outside tomato crops in this State.

CAUSE OF THE DISEASE.

Leaf mould is caused by the fungus *Cladosporium fulvum* Cke. Its life history is quite simple. With suitable conditions the fungus spore germinates, penetrating the breathing pore or stoma which occur on both surfaces of the leaf. Eventually dense masses of fungal filaments on which spores develop emerge from the stomata on the under surface of the leaf to constitute the visible mould patch. The period elapsing between the time of inoculation and the time when the disease is first evident depends principally on the time of the year that the inoculation is made. Under cool conditions the disease develops slowly compared with a greater rate under warm conditions. In an experiment conducted in an unheated glasshouse during October, symptoms of disease did not develop before the thirteenth day and spores in any quantity were not produced before the fifteenth. Under the best conditions of temperature and moisture the fungus may complete its life cycle in about 10 days. The results of some of Small's investigations([3]) may be mentioned here as they bear on the point just considered and they also provide important facts upon which the intelligent control of leaf mould is based.

Small found that 72° F. was about the temperature at which the disease developed most rapidly. At 50°-60° F. infection may occur if the air around the plants is sufficiently humid but the disease develops slowly. At 72° F. infection is severe where the relative humidity of the air surrounding the plants is 80 per cent. or higher but it is rare when the relative humidity is at 70 per cent.

CONTROL OF LEAF MOULD.

(1) Cultural Measures.

From the remarks that have just been made it is evident that apart from the presence of the causal fungus, a most important determining factor is the presence of a necessary combination of atmospheric temperature and humidity. It is along the lines of the controlling of these factors in a manner favourable to plant growth, but unfavourable to the development of the disease, that the most important steps in the control of leaf mould must be taken.

With the South Australian climate the temperatures necessary for the best development of leaf mould frequently occur for long periods in glasshouses and there appears to be no satisfactory or practicable method of adjusting this condition in a suitable direction. This means, then, that the grower must concentrate his attention on the other important factor, the humidity of the air in the glasshouse and seek to adjust it as well as possible. Fortunately, much can be done in this direction. Measures serving this purpose may now be considered.

(a) *Ventilation.*—By efficient ventilation, air humidity in a glasshouse can be greatly reduced. During winter, handling the ventilation of a house will not be difficult because the late afternoon temperatures are generally so low as to be unfavourable for leaf mould and a high relative humidity is less dangerous, so that inadequate airing is not likely to promote leaf mould unduly. Greater difficulties will arise in early spring when a fear of "chilling the plants" may cause a grower to cease airing a house before its absolute moisture content is low enough. Looked at in another way, it means that the house has not been allowed to cool down sufficiently before being closed. Most difficulty will be experienced when warm nights set in and temperatures close to the optimum for the disease may prevail for most of the night. Under such conditions it will be necessary to air houses late into the evening, perhaps all night. It is also important to secure good ventilation during warm, dull, rainy periods. Unfortunately many of the South Australian glasshouses are not well designed for ventilation and experience may show that improvements in this direction will have to be made. Opening the doors of a house helps to ventilate the ends of a house, but it does not have much influence at the centre. To secure ventilation of these parts may require the removal of glass from the sides and better provision for removal of air from the top of the house.

(b) *Watering.*—When possible, watering should be done early and on fine days only and heavy waterings at longer intervals are to be preferred to light waterings applied more frequently. Excessive watering must, however, be avoided as it produces soft susceptible plants.

(c) *Planting and Pruning.*—Houses should not be planted too closely. By attention to the pruning of the lower leaves of plants the most susceptible leaves are removed and a better movement of air which leads to a lessened humidity round the plant, takes place.

(2) Spraying and Dusting.

There is some difference of opinion among authorities concerning the value of spraying or dusting treatments for the control of leaf mould and it is evident that high hopes for its control by these measures cannot be encouraged.

This difficulty appears to be due in some measure to the fact that the fungus can penetrate either leaf surface with equal facility, and, while it is possible to protect the upper leaf surface with a spray or dust material, efficient coverage of the other surface with the usual materials is impracticable. European practice appears to favour the use of spray materials rather than dusts, but until we have had further local experience the question of what is the best, or if any spray should be used, must stand in abeyance.

(3) Fumigation of Houses.

The spores of leaf mould are resistant to summer weather conditions and it has been shown for English conditions that spores lodged in the framework of glasshouses provide material to infect the following year's crop. Thus, the disinfection of the empty glasshouse is a desirable precaution. Before doing this the house should be cleaned of all diseased plants and be sealed as completely as possible so as to confine the fumigant to be used.

For this purpose Small (4) found that sulphur dioxide generated by burning flowers of sulphur was effective. For a house that can be effectively sealed, sulphur should be used at the rate of 1 lb. per 1,000 cub. ft. Ordinary houses of from 100-130ft. in length would thus require 10-12lbs. of sulphur. Where houses cannot be sealed effectively, additional amounts of sulphur will be required. The sulphur for burning purposes should be distributed in small heaps so as to provide for quick burning and a rapid development of gas.

SUMMARY.

1. Tomato leaf mould (*Cladosporium fulvum*) is recorded as occurring on glasshouse grown tomatoes in South Australia.

2. A short outline of the principal symptoms is given so as to permit of a ready identification of the disease by growers.

3. The problem of the control of the leaf mould is discussed, particular stress being laid upon the necessity for keeping the humidity of air in the glasshouse consistent with good growing conditions for the plants as low as possible. Control in the direction desired is best secured by adequate ventilation of the house. Care should also be taken with watering the plants, and with their pruning so as to facilitate free movement of air through the house. Evidence from publications overseas concerning the value of spraying or dusting is of a conflicting nature and definite recommendations along these lines cannot be made.

Where a glasshouse has had a badly diseased crop growing in it, it is advisable that it should be disinfected before the next crop is grown in it. Disinfection can be effected by burning sulphur at the rate of 1lb. per 1,000 cubic feet in it when the house is empty.

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(3) Small, T.: Ann. Appl. Biol. 17, p. 71.
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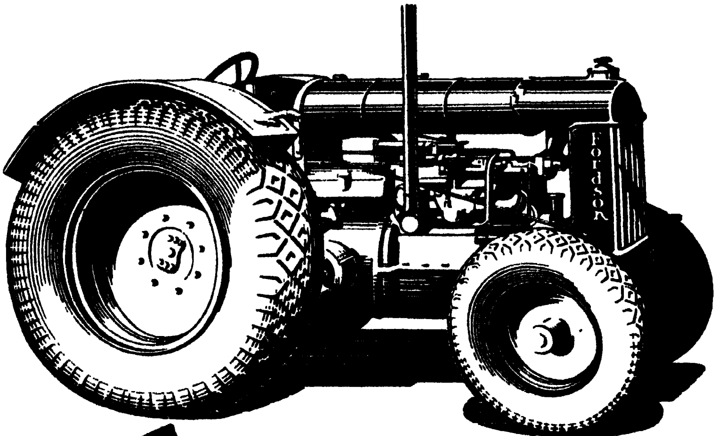

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RESULTS OF WHEAT CROP COMPETITIONS, SEASON 1935-36.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
	WAY.							
	Judged by W. H. Brownrigg, District Agricultural Instructor.							
1	Gaden & Linke, Koonibba	Ford	27	22	18	12	4	83
2	L. Martin, Maltee	Felix	26	20	17	12	4	79
3	P. A. Lange, Chinta .	Ford	24	20	18	13	3½	78½
4	A. E. Howlett, Goode	Ford	24	20	16	13	4	77
5	W. Eason, Ceduna ...	Nabawa	21	20	19	12	4	76
6	P. S. Morrison, Waranda	Nabawa	19½	20	19	13½	3	75
7	C. H. Collins, Ceduna	Quality	18	19	18	12	3½	70½
8	G. Lowe, Laura Bay..	Ranee	15	23	17	12	3	70
9	A. J. Bowell, Laura Bay	Waratah ...	18	16	14	14	3	65
	LE HUNTE.							
	Judged by W. H. Brownrigg, District Agricultural Instructor.							
1	P. P. Cook, Mount Damper	Ford	35	19	23	14	4½	95½
2	J. Christian, Yaninee	Nabawa	33	17	21	14	4	89
3	D. Kitto, Minnipa ...	Caliph	32½	16	21	13	3½	86
4	P. E. C. Daniel, Warramboo	Golden Drop	32	17	19	12½	3½	84
5	S. C. Billinghurst, Minnipa	Ford	30	17	20	13½	3	83½
6	J. McBeath, Kolballa	Merridin ...	31½	15	19	12½	3½	81½
7	A. Shepherd, Wudinna	Sword	24	16	23	14	3½	80½
8	G. Williams, Minnipa	Merridin ...	26	16	20	14	4	80
9	W. P. Bartley, Wudinna	Nabawa	26	16	20	13	3½	78½
10	S. C. Billinghurst, Minnipa	Merridin ...	22	17	20	14½	4	77½
11	T. L. Nottle, Yaninee.	Ford	25	17	19	13	3½	77½
12	H. Edmonds, Pygery	Ford	25	16	17	13	3	74
	BALAKLAVA.							
	Judged by W. C. Johnston, District Agricultural Instructor.							
1	A. N. & H. M. Freebairn, Owen	Sword	35	24	18½	14	3	94½
2	Bowyer Bros., Owen..	Ford	32	23	18	13½	3½	90
3	O. J. Wilson, Barabba	Sword	30	23	18	14	4	89
3	A. N. & H. M. Freebairn, Owen	Waratah and Sword	33	22	17½	13½	3	89
5	J. D. Campbell, Barabba	Sword	27	23½	19	14	3½	87
6	R. Reid, Owen.......	Sword	29	23	17	14	3½	86½
7	Harkness Bros., Owen	Sword	27	23	18	13½	3	84½
7	Sorrell Bros., Barraba	Sword and Ford	28	21	19	13	3½	84½
7	W. J. Marshman, Owen	Sword and Nabawa	24½	24	19	13½	3½	84½
10	H. Bradley, Owen ...	Sword and Sword	26	23	18	13	3	83
10	D. J. Wilson, Barabba	Ford	27	22	18	13	3	83
12	Bowyer Bros., Owen..	Nawab	28	20	18	13	3	82
12	E. Baker, Barabba ...	Nabawa and Ford	25½	23	17	13	3½	82

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100

NORTHERN YORKE PENINSULA.

Judged by W. C. JOHNSTON, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	J. C. Westbrook, Arthurton	Ford and Aussie	35	21½	18	12½	3½	90½
2	J. H. Robertson, Arthurton	Ford	34	23	16	13	4	90
3	Mrs. J. A. I. Bussenschutt, Paskeville	Sword	29	24	19½	13	3½	89
4	J. S. Henderson, Arthurton	Ford	30	23	19	13	3½	88½
5	G. E. & H. M. Meier, Paskeville	Sword	27	24½	19½	14	3	88
6	R. S. Bussenschutt Paskeville	Dundee and Carrabin	29	23	18	13½	3	86½
6	J. S. Henderson, Arthurton	Sword	29	21	19	14	3½	86½
6	K. Vidal, Cunliffe	Bencubbin and Sword	28	24	17	13½	4	86½
9	M. D. Wright, Cunliffe	Sword	25	24½	19½	13	4	86
10	C. Rodda, Thrington	Sword and Waratah	28	22½	17½	13½	4	85½
11	O. D. Jericho, Arthurton	Ford	30	20	19	13	3	85
12	J. H. Bussenschutt, jun. Paskeville	Sword	27	23	17	13	3	83
12	Geo. Rodda, Thrington	Sword	28	22	17	13	3	83
12	E. Yelland, Cunliffe ..	Waratah ...	26	23½	17½	13	3	83
12	T. Stanway, Boor's Plains	Sword	26	23	17	13	4	83
16	T. Rodda, Thrington .	Sword and Bearded Ford	26	21½	18	14	3	82½
17	W. A. Harris, Paskeville	Sword	24	23	18	13	3	81
18	C. Yelland, Cunliffe ..	Sword	24	23½	17	13	3	80½
19	H. D. Adams, Cunliffe	Ranee	26	21	17	13	3	80
19	M. R. Yelland, Cunliffe	Daphne	21	23½	18	14	3½	80

ALBERT.

Judged by R. L. GRIFFITHS, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	E. A. Kroehn, Nildottie	Gallipoli and Nabawa	32	24	19	14	4½	93½
2	A. E. Horstmann, Netherleigh	Bencubbin ..	32	22½	20	14½	4	93
3	T. C. Stott, Mindarie .	Bencubbin ..	31	22	18	14	4	89
4	A. E. Carslake, Kunlara	Gallipoli	28	23	19	13½	4½	88
5	J. F. Andriske, Galga	Late Gluyas	28	23	18	14	4½	87½
	J. W. G. Mann, Mindarie	Sword	27	23½	19	14	4	87½
7	J. B. Burnett, Caliph	Ford, Sword, S.H.J.	27	23	18½	14½	4	87
8	C. H. Russell, Halidon	Sword	27	22	19	14½	4	86½
	H. Bird, Halidon.....	Sword	26	22½	19	14½	4½	86½
10	J. F. Andriske, Galga	Sword	27	24	16½	14	4½	86
11	G. H. Sutherland, Copeville	Ranee 4H ..	27	22	18	14	4½	85½
12	F. C. Page, Kilpalie ..	Late Gluyas	26	22	17½	14	4	83½
13	A. G. W. Grant, Sandalwood	Sword	25	21½	16½	14½	4½	82
14	T. H. Stott, Mindarie	Bencubbin and Dart's Imperial	24	22½	16½	13½	3½	80

Results of Wheat Crop Competitions—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	110
	CENTRAL.							
	Judged by W. C. Johnston, District Agricultural Instructor.							
1	Dawkins & Aunger, Gawler River	Sword	35	23½	19	13½	4	95
2	A. M. Dawkins, Gawler River	Sword	33	21	19½	13½	4	91
3	C. S. Nankeville, Gawler River	Sword	30	23½	16½	13	3	86
4	J. Edon, Roseworthy	Sword	28	23	17	13½	4	85½
4	J. H. Dawkins, Gawler River	Sword	29	20½	18	14	4	85½
6	L. George, Wasleys ..	Sword	25	24	18½	13	4	84½
7	T. W. Day, Roeve's Plain	Sword	27	21	17	14	4	83
8	Aldridge & Dawkins, Gawler River	Ford	24	23	18	14	3	82
8	H. & M. Wehr, Freeling	Sword	25	21	19	13	4	82
10	M. H. Richter, Roeve's Plain	Sword	22	24	17	13½	4½	81
10	H. & M. Wehr, Freeling	Nabawa and Felix	24	21	19	13	4	81
12	J. Jarmyn, Mallala ..	Sword	24	20	19	14	3	80
12	H. J. W. Griffiths, Salisbury	Dundee	20	24½	19	12½	4	80
14	O. H. V. Menzel, Roseworthy	Sword	25	19	19	13	3½	79½
14	Geo. Hoinjus, Sheoak Log	Sword	22	21	19½	14	3	79½
16	G. W. Minchen, Wasleys	Sword	23	20	16	13½	3	75½
16	O. E. C. Ward, Gawler	Nabawa and Ford	20	22	18	12½	3	75½
	ALFRED.							
	Judged by R. L. Griffiths, District Agricultural Instructor.							
1	G. E. Hyde, Paruna .	Sword	29	24	20	14½	4½	92
2	A. C. Webb, Paruna .	Sword, Baringa	29	24	19½	14½	4½	91½
3	D. and H. Kretschmer, Paruna	Nabawa	29	23½	20	14½	4	91
4	E. M. Edwards, Paruna	Ranee 4H ..	29	23	19	14	4½	89½
	G. E. Hyde, Paruna .	Nabawa	27	23½	20	14½	4½	89½
	G. E. Hyde, Paruna .	Ranee 4H ..	28	23½	19½	14	4½	89½
	A. C. Webb, Paruna .	Sword	27	24	19½	14½	4½	89½
	G. J. Zimmermann, Meribah	Caliph	28	24	18	14½	5	89½
9	P. Paull, Alawoona ..	Ranee 4H ..	29	23½	19	14	3½	89
10	G. J. Zimmermann, .. Meribah	Nabawa	24	24	19½	14½	5	87
11	W. Paull, & Sons, Alawoona	Gallipoli	27	22	18½	14	4	85½
	A. Fisher, Noora	Sword	24	22½	19½	14½	5	85½
13	A. C. Webb, Paruna .	Nabawa	23	22½	20	14½	4½	84½
14	Murray Shannon, Loxton	Ranee	24	22	19	13½	4	82½
15	P. B. Schwartz, Nangari	Gluford, S.H.J., Silver Bart	23	22	19	13	5	82
16	A. J. Ward, Paruna ..	Ghurka, Golden Drop	24	21	16	13½	4	78½

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100

FAR NORTHERN.

Judged by E. L. ORCHARD, District Agricultural Instructor.

1	W. G. Gregurke, Wepowie	Ranee 4H ..	28	24	19	14	4	89
2	T. F. Orrock, Wepowie	Dundee	28	23½	19	14	3	87½
3	E. H. Hampel, Terka	Ranee	30	22	18	13	2½	85½
4	E. H. Hampel, Terka	Dundee, Ranee 4H, Sword	29½	22	18	13	2	84½
5	J. G. Crocker, Wepowie	Ranee 4H ..	27	22	19	13½	2	83½
6	I. G. Schulz, Terka ..	Ranee 4H, Waratah	28	21	18	12½	3	82½
7	E. H. Schulz, Terka .	Waratah ...	30	19	17	12	4	82
8	E. W. E. Paech, Box 89, Orroroo	Ranee	28	20	19	12	2½	81½
9	A. F. Duhring, Wilmington	Nabawa	31	19	16	12	3	81

SOUTHERN.

Judged by R. HILL, District Agricultural Instructor.

1	L. Wachtel, Palmer ..	Sword, Ranee	35	24	19	13	4½	95½
2	A. B. Jaensch, Hartley	Ford	34	23½	17	14	4½	93
3	C. S. E. Paech, Tepko.	Sword	31	23	20	14	4¾	92¾
4	E. & T. Jaensch, Hartley	Sword	33	24	18	14	3½	92½
	E. & T. Jaensch, Hartley	Ford	32	23	19	14	3¾	91¾
6	A. B. Jaensch, Hartley	Nabawa	30	23	19	15	3¾	90¾
7	O. E. Wegoner, Millendilla	Sword	30	23½	19	13½	4½	90½
8	Thomas Bros, Monarto South	Ranee	32	22	18	12½	4½	89
9	N. Wachtel, Mannum	Sword	27	24	19	14	4	88
	Mrs. E. Hartmann, Monarto South	Sword	30	23½	17	13½	4	88
	A. R. Strauss, Monarto South	Ranee	32	22	17	12½	4½	88
12	Mattner Bros. and G. Kennedy, Finniss	Sword No. 1	32	19	18	14½	3½	87
	J. J. Hartmann, Monarto South	Waratah ...	28	23	18	14	4	87
	E. & T. Jaensch, Hartley	Bencubbin, Ranee, Ghurka	29	23	18	13½	3½	87
15	Wachtel Bros., Mannum	Sword and Nabawa	28	23	18	13	4	86
	P. B. Frahn, Monarto	Currawa	29	22	18	13	4	86
	Thomas Bros., Monarto South	Sword	27	22½	18	14½	4	86
	H. H. Cross, Woodchester	Ford	28	22½	17½	14	4	86
19	Frahn Bros., Monarto	Ranee	28	23½	17	13½	3½	85½
	E. E. Liebelt, Monarto	Sword and Nabawa	25	23½	18	14½	4½	85½
21	A. C. Bormann, Millendilla	Sword	24	23	19	14	4½	84½
	H. H. Cross, Woodchester	Nugget, Sword	27	22	17½	14	4	84½
23	G. Cross, Belvidere ..	Waratah and Sword	26	22½	18	14	3½	84

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

Position.	Name and Address of Competitior.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
		SOUTHERN—continued.						
24	Rankine Bros., Strathalbyn	Baroota Wonder, Baringa, Waratah	28	21	17	13½	4	83½
	E. H. Frahn, Monarto	Nugget and Currawa	28	23	17	12	3½	83½
26	Frahn Bros., Monarto	Sword	25	22	18	14½	3¾	83¼
27	S. Bretag, Mannum ..	Ranee	25	22	18	13	4¼	82¼
28	S. Wachtel, Palmer...	Ranee	29	23	15	11	4	82
29	G. Donaldson, Sandergrove	Waratah ...	26	22	18	12	3½	81½
30	Hugo Paech, Rockleigh	Dundee, Sword, Bencubbin	23	22	18	14	4¼	81¼
31	E. R. Rolland, Rockleigh	Nabawa, Waratah, Currawa	28	20	18	12	3	81
32	Mattner Bros. and G. Kennedy, Finniss	Sword No. 2	28	18	18	13	3½	80½
	V. W. Eichler, Mannum	Sword	21	21½	19	14½	4½	80½
34	W. R. Pese, Mannum	Ranee, Sword	24	21½	17½	13	4	80
	B. O. Kubank, Palmer	Sword, Ranee, and Nabawa	25	21	17	13	4	80
	L. M. Eichler, Mannum	Ranee, Nabawa	23	22	18	13	4	80
37	H. H. Schubert, Brinkley	Sword	23	21	17	15	3½	79½
38	L. A. Krause, Palmer	Sword, Ranee	23	22	18	12	4	79
39	B. R. W. Lindner, Mannum	Sword, Ranee	22	21½	18	13	4	78½
40	H. A. Krause, Palmer	Sword, Ranee	22	22	17	13	4	78
	G. W. Faehrmann, Palmer	Sword	21	22½	17	13½	4	78
42	H. A. Helbieg, Mannum	Sword and Nabawa	23	21	17	13	3½	77½
43	J. M. Hudd, Hartley .	King's Early, Waratah	22	21	17	13	4	77
	S. A. Bretag, Mannum	Sword	20	21	18	14	4	77
45	H. B. Scheer, Mannum	Sword	21	21	18	13	3½	76½
	F. R. Bormann, Millendilla	Nabawa	24	22	14	13	3½	76½
47	J. O. Bottroff, Palmer	Sword and Nabawa	21	21	16	13	3½	74½
48	C. A. Whittlesea, Langhorne's Creek	Ranee, Waratah, Sword	20	21	16	12	4	73
49	C. F. Altmann, Monarto South	Ranee	19	18	17	14½	3½	72
50	G. A. Quast, Millendilla	Nabawa	17	21	17	12	3½	70½

JERVOIS.

Judged by H. D. ADAMS, District Agricultural Instructor.

Position.	Name and Address of Competitior.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	G. Sims, Cleve	Sword, Nabawa	32	24	19	14	4	93
2	H. E. Steinke, Cleve .	Waratah ...	33	23½	18	13½	4	92
3	G. Sims, Cleve	Waratah ...	32	23½	18½	13½	4	91½
4	H. E. Steinke, Cleve .	Gluyas......	32	23	18	13½	4	90½

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

JERVOIS—continued.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
4	H. E. Steinke, Cleve .	Ford	33	23	17½	13½	3½	90½
	C. E. Stubing, Cleve..	Ford	33	23	17½	13½	3½	90½
7	C. E. Stubing, Cleve .	Sword	32	23	18	13½	3½	90
	A. Spriggs, Yadnarie .	Ford	29	24	19	14	4	90
9	W. C. McCallum, Arno Bay	Sword	29	24	18½	14½	3½	89½
10	A. V. Preiss, Cleve ...	Sword	30	23	18½	13½	4	89
	J. C. Sims, Cleve	Felix	29	23½	18½	14	4	89
	M. H. Burton, Rudall	Waratah ...	29	23½	18	14½	4	89
	D. C. McCallum, Rudall	Waratah ...	28	24	18½	14½	4	89
	J. P. Story, Miltalie ..	Sword	28	24	19½	13½	4	89
15	O. O. Kobelt & Sons, Cleve	Sword	29	23	19	13½	4	88½
	H. F. Brine, Miltalie..	Waratah ...	27	24	19	14½	4	88½
	J. Brus & Sons, Mangalo	Sword	28	24	19	13½	4	88½
	T. L. Badman, Miltalie	Ranee	28	23½	18½	14½	4	88½
19	J. J. Leonard, Cleve .	Waratah ...	28	24	18	13½	4	87½
	A. Bartels, Cleve	Waratah ...	29	23	18	13½	4	87½
	O. O. Kobelt, & Sons, Cleve	Glede	27	24	18½	14	4	87½
	D. G. Ramsay, Miltalie	Ranee	27	24	19	14	3½	87½
	D. C. McCallum, Rudall	Sword	27	24	18½	14	4	87½
	F. H. Pearce, Rudall	Waratah ...	29	23½	17½	14	3½	87½
	J. C. Sims, Cleve	Waratah ...	28	23½	17½	14½	4	87½
26	A. Spriggs, Yadnarie .	Sword	27	23½	18	13½	3½	85½
	F. B. Hampel, Rudall	Gluyas......	26	23½	18½	13½	4	85½
28	C. G. Hannamann, Mangalo	Waratah ...	25	23	19	13½	3½	84
	F. B. Hampel, Rudall	Waratah	25	24	18½	13	3½	84
30	F. H. & A. M. Pearce, Rudall	Waratah ...	24	24	18	14	3½	83½
31	F. Schiller, Mangalo .	Sword	23	23	19	13½	3½	82

BUXTON.

Judged by H. D. ADAMS, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	Martin Bros., Kimba .	Sword	33	23½	19½	13½	4	93½
2	C. G. & G. W. Cant, Kimba	Ranee 4 H ..	31	24	18½	14½	4½	92½
	F. Newman, Kimba ..	Sword	32	23½	19½	13½	4	92½
4	Lienert Bros. Pinkawillinie	Felix	30	24	19	14	4	91
5	J. E. Beinke, Kimba .	Gluyas......	30	23½	18	14½	4½	90½
6	A. B. Akinsen, Pinkawillinie	Felix	27	24	19½	14	3½	88
7	C. K. Wake, Pinkawillinie	Merridin	26	23½	18½	13½	4	85½
	F. Freeth, Pinkawillinie	Nabawa	25	24	19	13½	4	85½
	J. J. Rogers, Pinkawillinie	Felix, Ranee	25	24	19	13½	4	85½
10	L. S. & L. L. Beinke, Kimba	Aussie, Gluyas	24	23	18	13½	4	82½

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100

MIDLANDS.

Judged by W. C. Johnston, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	R. L. Sluggett, Hill River	Dan	35	22	18½	14	3½	93
2	P. McD. Smyth, Salter's Spring	Ford	35	23	17	13	3½	91½
3	P. McD. Smyth, Salter's Spring	Sword	34	23½	16½	13	4	91
4	H. Schunke, Manoora.	Gallipoli	31	23	19	14	3½	90½
5	P. McD. Smyth, Salter's Spring	Ranee 4H and Marathon	32½	22	18	13½	4	90
5	S. Garrard, Mintaro ..	Gallipoli	30	23	18½	14	4½	90
7	F. Coleman, Saddleworth	Ranee 4H, Dundee	30	23½	18	14	4	89½
8	R. F. Thomas, Hallett	Gallipoli	25½	24½	19½	14½	4	88
9	R. F. Kelly, Manoora	Ranee	30	22	18	14	3½	87½
9	J. Garrard, Mintaro ..	Ranee and Gallipoli	29½	23	18	14	3	87½
11	E. V. H. Wilsdon, Spalding	Ford	34	21	16	13	3	87
11	J. H. Torr, Farrell's Flat	Mogul	28	23	19	14	3	87
13	W. R. Woods & Sons, Wirrilla	Dundee	28½	22	18½	14	3½	86½
14	E. Finch, Kooringa...	Ranee	28	23	18	13	4	86
14	L. A. Martin, Farrell's Flat	Dundee	28	22	18½	14½	3	86
14	J. Ross, Mintaro	Waratah ...	26	24	18	14	4	86
17	Hughes Bros., Kapunda	Sword	27	23½	17	14	4	85½
18	J. S. Lake, Owen	Sword, Ford, and Marathon	28	23	17½	13	3½	85
18	E. V. H. Wilsdon, Spalding	Dan	30	22	17	13	3	85
18	J. H. Torr, Farrell's Flat	Dundee and Dan	25½	23½	19	13	4	85
18	F. Coleman, Saddleworth	Ghurka	28	22	19	12	4	85
22	J. Ross, Mintaro	Gallipoli	28	23	17	13	3½	84½
22	Molineaux Bros., Tarlee	Sword	23	24	19	14	4½	84½
22	D. & J. Kelly, Giles' Corner	Dundee	25½	22	19	14	4	84½
22	J. H. Roberts, Spalding	Sword & Dan	26½	22	19	14	3	84½
26	Geo. Hazel, Kapunda	Ranee 4H ..	26½	24	18	12	3½	84
26	R. Blatchford, Mintaro	Ranee 4H ..	26½	21	19	14	3½	84
26	W. R. Woods & Sons, Wirrilla	Kerley's Early and Gallipoli	28	22	17½	13	3½	84
29	T. W. Allen, Auburn .	Dundee, Ranee, and Ghurka	25½	23	18	13	4	83½
29	C. J. Lake, Owen	Ranee and Ford	28	22	17	13	3½	83½
29	A. J. Jones, Manoora	Gallipoli	26½	23	18	13	3	83½

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
		MIDLANDS—*continued.*						
31	P. J. Scholz, Buchanan	Sword	26½	21	18	13½	4	83
32	J. F. W. Reicheldt, Tarnma	Ranee, Dundee, and Carrabin	26½	22	18	13	3	82½
32	R. F. Wake, Tarlee...	Dundee	28	22	17	12½	3	82½
32	R. R. Bartholomaeus, Farrell's Flat	Baldmin	26½	22	17	13	4	82½
35	A. G. Kirk, Farrell's Flat	Mogul and Sword	22½	23½	18	14	4	82
36	D. H. Campbell, Buchanan	Ranee and Sword	21½	23	19	14	4	81½
36	G. R. Finch, Hanson .	Ranee	24½	23	18	12	4	81½
38	J. Garrard, Farrell's Flat	Dan	21	23	19½	14	3½	81
38	A. E. Crossing, Farrell's Flat	Nabawa and Gallipoli	24	22	17	14	4	81
38	P. C. Schnaitmann, Saddleworth	Kings and Waratah	22½	23	18½	14	3	81
41	D. L. Clarke, Tarlee .	Sword	25½	22	17	13	3	80½
41	C. J. H. Behn, Riverton	Dundee, Sword, and Baringa	24½	23	17	13	3	80½
41	R. F. Thomas, Hallett	Gallipoli	21½	23½	19	13½	3	80½
44	W. Ley, Farrell's Flat	Gallipoli	23	21	18	14	4	80
44	Miller Bros., Farrell's Flat	Ranee	24	22	18	13	3	80
46	R. G. Townsend, Saddleworth	Waratah and Sword	23	21	18½	14	3	79½
46	L. V. Bell, Marrebel .	Ranee	21	22	19	14½	3	79½
48	Gask Bros., Gum Creek	Carrabin and S.H.J.	22	22	19	13	3	79
48	H. J. Turner, Kooringa	Nabawa and Bena	21½	22½	19	13	3	79
48	A. L. Sandow, Mintaro	Gallipoli	23	24	16	13	3	79
51	M. M. Freebairn, Owen	Nabawa and Nawab	22½	21½	18	13½	3	78½
51	A. F. Arend, Tarlee ..	Sword	24½	22	16	13	3	78½
53	T. A. Freebairn, Owen	Ford	20	24	18	13	3	78
53	W. J. Diprose, Tarlee	Sword	23	21	16	14	4	78
55	Miller Bros., Farrell's Flat	Gallipoli	22	22	17	13	3	77
55	A. J. Jones, Manoora	Sword	20	23	17	14	3	77
58	W. P. Ruediger, Buchanan	Sword and Ranee	21½	21	17½	13	3	76
58	C. P. Turner, Kooringa	Bena and Ford	20	22	18	13	3	76
60	E. W. Rohde, Tarnma	Ranee and Sword	20	21	19	12	3	75
60	R. Hean, Mintaro ...	Wannon	20	22	17	13	3	75
60	J. L. C. Freebairn, Alma	Caird and Aussie	23	21	17	11	3	75
60	G. Klem, Farrell's Flat	Plueckhahn's and Dundee	21	22	16	13	3	75

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

CHANDOS.

Judged by R. L. GRIFFITHS, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
1	E. S. Ross, Parrakie .	Sword	33	23½	20	14½	4	95
2	R. A. Hamann, Lameroo	Sword	31	23½	19	14	4½	92
3	J. Webb, Parrakie ...	Waratah ...	32	23	18½	13½	4½	91½
4	A. J. Beelitz, Parrakie	Ranee 4H ..	32	22	19	14	4	91
5	F. Hayward, Lameroo	Gluclub	32	22½	19	12½	4½	90½
5	M. W. Conlon, Lameroo	Waratah ...	30	24	18½	14	4	90½
5	F. Ross, Parrakie	Sword	30	24	18	14½	4	90½
5	A. Y. Knight, Geranium	Sword	29	23½	19	14½	4½	90½
9	R. A. Hamann, Lameroo	Sword, Ranee 4H, and Ghurka	30	23	18½	14	4½	90
9	Przibilla Bros., Parrakie	Silver Bart .	30	23	19	14	4	90
9	H. Hunt, Geranium ..	Sword	30	23	19	14	4	90
12	C. H. E. Hentschko, Lameroo	Sword	28	22½	20	14½	4½	89½
12	M. Webb, Parrakie ..	Ranee 4H ..	31	22½	17½	14	4½	89½
12	W. J. Ross, Parrakie .	Waratah ...	29	23½	19	14	4	89½
15	W. C. Fuss, Lameroo	Rajah	29	22½	19½	14	4	89
15	W. H. Cabot, Parrakie	Sword	27	24	19	14½	4½	89
17	F. H. Whittlesea, Jabuk	Sword	29	23	18	14	4	88
18	H. E. Vogt, Pinnaroo	Sword	27	23	18½	14½	4	87
18	O. Heinzel, Parrakie .	Currawa, Walker's Wonder	30	21½	19	12	4½	87
18	R. F. Eylward, Jabuk	Sword	29	23	17	14	4	87
21	A. Hutchens, Parilla..	Waratah ...	26	22	19	14½	4½	86
22	R. C. & H. J. Sheldon, Pinnaroo	Bobin	26	22	19	14½	4	85½
23	Mattiske Bros., Pinnaroo	Ranee 4H ..	25	22	19	14½	4½	85
23	A. H. Edwards, Pinnaroo	Sword	24	23	19	14½	4½	85
23	G. A. McCormack, Parilla	Waratah ...	25	22½	19	14½	4	85
23	C. O. Schumacher, Parilla	Ranee 4H ..	26	22½	19	14	3½	85
27	Young & Blacksell, Pinnaroo	Waratah ...	25	22½	18½	14½	4	84½
27	R. C. Kerley, Parilla .	Bobin, Major	25	23	18½	13½	4½	84½
27	J. L. Byrne, Lameroo	Rajah	26	22½	18½	13½	4	84½
30	A. M. Nordhausen, Pinnaroo	Currawa	25	22	19½	13½	4	84
31	H. F. Johnson, Parilla	Waratah ...	24	22	19	14½	4	83½
31	C. W. Worsley, Parilla	Ranee 4H ..	25	22	18	14	4½	83½
31	E. F. Worsley, Parilla	Sword	24	23½	17	14½	4½	83½
31	J. L. Koch, Lameroo .	Waratah ...	23	23	19	14½	4	83½
35	L. M. Symon, Pinnaroo	Ranee 4H ..	22	24	19	14	4	83
36	A. J. A. Koch, Lameroo	Bencubbin, Ghurka	22	22	20	14	4½	82½
37	H. M. Symon, Pinnaroo	Ghurka, Ranee 4H	22	22½	19½	14	4	82

RESULTS OF WHEAT CROP COMPETITIONS—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
	CHANDOS—*continued.*							
37	C. O. Hill, Parilla	Waratah ...	23	21	19	14½	4½	82
39	W. Backman, Parilla .	Ranee 4H ..	23	22	18½	14	4	81½
40	M. McKenzie, Pinnaroo	Gallipoli	24	20	19	14	4	81
40	F. S. Traeger, Pinnaroo	Nabawa	21	22	19½	14½	4	81
42	F. A. Meagher, Pinnaroo	Gallipoli	20	22	19½	14½	4½	80½
42	W. H. Batten, Parilla	Ranee 4H ..	20	24	18½	13½	4½	80½
44	Young & McInerney, Pinnaroo	Ranee 4H ..	20	22	19½	14	4½	80
44	R. J. Billing, Pinnaroo	Ranee 4H	19	23	19½	14	4½	80
44	L. McKenzie, Pinnaroo	Gallipoli	23	20	19	14	4	80
47	A. J. Niejalke, Pinnaroo	Sword	20	21	19½	14½	4½	79½
48	Traeger Bros., Pinnaroo	Ghurka	21	22	18½	13½	4	79
49	Foale & Sons, Parilla	Ranee 4H ..	20	21½	18½	14	4½	78½
50	F. A. Meagher, Pinnaroo	Ranee 4H ..	19	21½	19½	14	4	78
51	H. L. Badman, Pinnaroo	Sword	19	20	19½	14½	4½	77½
51	L. J. T. Foale, Parilla	Ranee 4H ..	20	21	18	14	4½	77½
51	F. W. Gravestock, Parrakie	Sword, Waratah	22	20	17½	14	4	77½
	JUNIOR ENTRIES.							
1	A. Hutchens, Parilla..	Waratah ...	26	22	19	14½	4½	86
2	L. E. Vogt, Pinnaroo	Sword, Ranee	25	22½	18	13½	4	83
3	R. M. Neindorf, Parilla	Bobin	22	22½	20	14	4	82½
4	H. A. Jones, Parilla ..	Bobin	23	22	19	14½	3½	82
5	A. W. Blacksell, Pinnaroo	Ranee 4H ..	21	22	19½	14	4	80½
5	W. Batten, Parilla ...	Ranee 4H ..	20	24	18½	13½	4½	80½
7	A. G. Johnston, Pinnaroo	Ranee 4H ..	21	22½	18	14	4	79½

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Results of Wheat Crop Competitions—*continued.*

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100

SOUTHERN YORKE PENINSULA.

Judged by R. Hill, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	N. H. Boundy, Minlaton	Ford	35	22	18	14	4	93
2	W. S. Watters, Curramulka	Sword	34	22	20	12	4	92
3	A. J. Short, Curramulka	Bobin	35	21	17	14	4½	91½
4	O. H. Bittner, Curramulka	Sword, Daphne, and Bencubbin	34	22	18	12½	4½	91
5	W. H. and J. Alderman, Minlaton No. 1	Ford and Sword	32	23	17	13½	4½	90
6	W. L. Boundy, Minlaton	Waratah ...	35	19	18	13	4	89
7	H. Polkinghorne, Minlaton	Sword	30	20	20	14½	4	88½
8	W. H. and J. Alderman, Minlaton No. 2	Ford and Sword	30	22½	17	14	4½	88
8	W. S. Watters, Curramulka	Waratah ...	29	23	18	13½	4½	88
10	W. H. and J. Alderman, Minlaton No. 3	Ford	26	23	16	14	4	83
11	Frank H. Tonkin, Minlaton	Daphne	24	21	19	12	4	80

MID YORKE PENINSULA.

Judged by R. Hill, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	S. W. A. Heinrich, Maitland	Geeralying and Sword	34	21	20	14	4½	93½
2	J. S. Henderson, Maitland	Ford	32	21	20	13	4	90
3	V. A. Dutschke, Ardrossan	Ford	30	21	19	13	4	87
4	J. S. Henderson, Maitland	Sword	31	19	20	13	3½	86½
5	R. J. T. Dutschke, Maitland	Ranee	30	20	18	12	4¾	84¾
6	E. F. Heinrich, South Kilkerran	Dan	26	20	19	13½	4½	83
6	H. O. Linke, South Kilkerran	Sword and Ford	25	23½	16	14	4½	83
8	G. Bittner, South Kilkerran	Sword and Ford	25	23½	16	14	4	82½
9	O. H. Heinrich, South Kilkerran	Ford	23	22	18	14½	3½	81
10	O. B. Linke, South Kilkerran	—	21	22	18½	14½	3½	79½
11	J. C. A. Arnold, South Kilkerran	Ranee and Sword	25	22½	15	12	4¾	79¼
12	P. C. J. Marschall, South Kilkerran	Sword	21	22	18	14	3¼	78¼
13	W. A. Heinrich, South Kilkerran	Ranee	22	21	16	14	4	77
14	R. E. Hasting, South Kilkerran	Ranee	23	17	17	11	3	71

AGRICULTURE IN THE TEMPERATE AND SUB-TROPICAL CLIMATES OF THE SOUTH.

[A Report by the Deputy Director of Agriculture (W. J. Spafford) to His Excellency Sir Winston Dugan, K.C.M.G., C.B., D.S.O., Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia. Mr. Spafford took a brief tour of portions of the principal agricultural countries in the same climatic zones as the settled portions of Australia, in fulfilment of the appointment as Honorary Commissioner, conferred upon him by His Excellency, to inquire into and report upon the Production and Preparation for Marketing of Agricultural Products, including Crops and Livestock in South America, South Africa, and New Zealand.]*

SOUTH AFRICA.

(*Continued from page* 523.)

So much gold has been mined in South Africa and exported overseas for such a long time that there appears to have been a tendency in that country to neglect agricultural activities, at all events in so far as production for export is concerned, but although this may have been true in the past it is not so to-day, and very great interest is being shown, and heavy expenditure incurred, in making up leeway in this direction.

AGRICULTURAL CONDITIONS OF SOUTH AFRICA.

Although South Africa is never looked upon as one of the good agricultural countries of the world, and this largely because of the high proportion of stony country and the patchiness of the good soils, nevertheless, in the aggregate, it contains a fairly considerable area of country capable of high production.

In a general way South Africa consists of plains from which rise great numbers of steep-sided, flat-topped, stony hills, the soil on the table-tops of the hills being in most cases shallow, but where sufficient rain is received are capable of growing grasses and herbs for the maintenance of fairly large numbers of livestock. On the plains themselves most of the soils are of greater depth, and in some cases of much better quality, and a good number of them are well suited for crop growing. In the more prominent valleys and alongside the rivers first-class agricultural soils are met with, and in these places, fruits, vegetables, and pastures are produced quite well. South Africa's agriculture appears to be limited by the incidence of the rainfall, rather than by the total amount received, or by the quality of the soils, for in many localities large areas of really fertile soils are built up, and then over a period of years rains of a torrential nature are experienced, which lead to the washing away of the soil. This soil erosion is so bad during some periods of time that nearly all of the loose earthy material which has taken such a very long time to form the deposits of some of the valleys is removed, and what were once really good agricultural lands become barren wastes, with deep gorges having precipitous sides and banks of raw soils incapable of growing cultivated crops. Judged by present-day appearances this process has been going on for centuries in portions of South Africa, the soil particles, liberated when the rocks disintegrate, fill up the valleys, only to be washed away when torrential rains again become of frequent occurrence.

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*Tour made in the company of Col. C. P. Butler ("Yattalunga," of the *Advertiser*).

A considerable amount of soil erosion is taking place at present, but the Government is making a strenuous effort to check the advance of the trouble wherever it is likely to prove worth while, and by the work undertaken is saving a vast area of good agricultural land which would otherwise, most assuredly, be washed away.

The Climate of South Africa.

The climate of South Africa varies from truly Mediterranean over a small area at the south-west corner up to arid and almost desert across the north-west corner, and from the western side it passes through temperate conditions towards the east and north-east to reach tropical climate at the north, the uppermost boundary of the country being about 100 miles above the Tropic of Capricorn. The height of the country affects the climate, and considering that the southernmost point of South Africa does not reach 35° S. latitude, and that the northern boundary is in the tropics, the climate is remarkably favourable, and appears wholly due to the fact that nearly all of the country is more than 3,000ft. above sea level, and so a temperate, instead of a sub-tropical climate, is experienced over a vast stretch of territory. The presence of such a large extent of low-rainfall country on the west side accounts for the prevalence of hot winds and duststorms, which are of frequent occurrence. Although frosts during the winter season are not unusual in inland districts, snow does not occur very frequently.

Experimental Plots of Field Crops at Potchefstroom School of Agriculture.

A great effort is being made by the Department of Agriculture of South Africa to develop crop-growing in various parts of the Union, and extensive experimental work is being carried out with all crops likely to prove suitable

The Rainfall.

The average annual rainfall varies between the fairly large area on the west which receives less than 5in., through all stages to a few scattered small spots where over 75in. are recorded per annum on the average. Not only is the range of rainfall great, but the variation in average fall comes very rapidly in the south-west and north-east corners of the country. This is particularly noticeable near the Table Mountain on which the average annual rainfall is 74¾in., whilst at its foot, and only about 6 miles in a horizontal distance, the quantity received is only 24¼in., and towards the north-east the annual recordings rapidly diminish until in about 100 miles from the mountain less than 5in. constitute the annual rainfall.

About one-third of the whole country receives less than 10in. of average annual rainfall, and about one-quarter records over 25in. More than half of the Union receives above 15in. of average annual rainfall, but as practically the whole of the area served is in the summer rainfall zone, thunderstorms with hail are frequent, and instead of light, steady falls of rain it is not unusual to get 2in. of rain in a day, and occasionally 3in. to 4in. of rain fall in a few hours.

That much of South Africa receives its rain in the summer period is shown in the following table where the distribution of the rainfall of 30 recording stations, scattered fairly evenly over the country, is set out:—

Distribution of Rainfall in South Africa.

Station.	Location.		Above Sea Level.	Period of Records.	Average Annual Rainfall.	Distribution.			
	Long. E.	Lat. S.				Winter. June to Aug.	Spring. Sept. to Nov.	Summer. Dec. to Feb.	Autumn. March to May.
			Feet.	Years.	Inches.	%	%	%	%
Ookiep	17° 52′	29° 36′	3,036	44	6·90	43·3	17·4	10·3	29·0
Calvinia	19° 46′	31° 29′	3,500	45	8·46	36·4	17·3	12·3	34·0
Worcester	19° 26′	33° 39′	780	53	12·38	44·3	22·1	8·2	25·4
Kakamas	20° 36′	28° 46′	—	4	5·98	7·2	3·3	34·1	55·4
Amandelboom ..	20° 55′	31° 21′	3,600	12	5·19	13·1	15·8	33·5	37·6
Ladismith	21° 17′	33° 29′	1,860	48	14·00	22·3	25·4	22·3	30·0
Beaufort West .	22° 36′	32° 21′	2,850	48	9·69	9·7	21·1	33·8	35·4
Morokwen..... ..	23° 47′	26° 07′	4,000	17	12·29	4·4	18·6	44·0	33·0
Kuruman II. .. .	23° 27′	27° 25′	4,500	18	16·36	3·5	12·2	53·3	31·0
Griquatown . ..	23° 15′	28° 51′	4,300	43	12·78	6·1	15·0	40·2	38·7
Britstown	23° 31′	30° 35′	3,685	39	11·47	7·7	16·5	33·5	42·3
Kimberley . .	24° 46′	28° 44′	4,042	41	15·86	5·0	19·5	43·1	32·4
Beestekraal . .	24° 45′	30° 55′	4,100	4	8·72	9·5	32·8	28·6	29·1
Graaff Reinet .	24° 32′	32° 16′	2,460	64	14·32	11·1	25·2	33·0	30·7
Schweizer Reneke	25° 15′	27° 08′	4,500	13	19·61	3·7	21·7	48·0	26·6
Colesberg	25° 07′	30° 43′	4,470	49	15·72	8·2	18·7	37·7	35·4
Ceres	26° 55′	28° 51′	4,600	8	18·22	8·4	24·1	46·3	21·2
Bloemfontein .	26° 12′	29° 07′	4,500	42	21·58	5·6	21·2	43·2	30·0
Alice	26° 50′	32° 47′	1,720	41	22·58	12·2	25·6	33·1	29·1
Kroonstad .	27° 14′	27° 40′	4,300	46	24·21	4·4	25·2	44·6	25·8
Senekal ..	27° 37′	28° 19′	4,750	21	25·29	3·7	26·9	45·1	24·3
Dordrecht .	27° 02′	31° 24′	5,390	18	21·94	5·9	19·1	46·3	28·7
Vaalwater .	28° 07′	24° 18′	3,700	10	23·87	3·2	22·6	55·8	18·4
Pretoria ..	28° 12′	25° 45′	4,350	24	29·45	2·9	27·3	49·8	20·0
Fouriesberg .. .	28° 12′	28° 37′	5,900	19	30·08	4·4	27·0	46·4	22·2
Mount Fletcher .	28° 30′	30° 12′	5,500	35	27·74	5·4	23·3	48·9	22·4
Newcastle ...	29° 56′	27° 45′	3,890	32	37·89	3·1	26·8	49·7	20·4
Lydenberg ...	30° 27′	25° 06′	4,820	22	24·81	2·4	27·5	52·0	18·1
Pietermaritzberg	30° 22′	29° 35′	2,272	31	36·94	4·6	27·2	45·5	22·7
Mbabane	31° 09′	26° 19′	3,800	23	55·59	3·9	25·5	48·6	22·0

Not only does the above table show how proportionately few are the recording stations in which winter rainfall predominates but that, without exception, they are relatively low-rainfall localities where this Mediterranean climate occurs. The area where winter rainfall is important is limited in extent and is located on the western side of South Africa, and as the east and north-east are approached so the maximum point in the rainfall moves from the winter to the spring, and finally into the summer. The position in this connection is such that it can almost be said for South Africa that it is a country of spring and summer rainfall, for only about one-sixth of the whole receives more than 50 per cent. of its rainfall in the six-months period covering autumn and winter. On the other hand about five-sevenths of the area of the Union gets 70 per cent. or more of its rain during the six-months period which includes the spring and summer seasons.

The concentration of the rainfall towards the end of the summer is probably seen more readily in the next table, where the months of maximum and minimum falls are shown for 513 recording stations, selected from various parts of the country.

The Months of Maximum and Minimum Rainfall in 513 Selected Stations in South Africa.

	Monthly Averages of Several Years.	
	Month of Maximum Rainfall.	Month of Minimum Rainfall.
	No. of Districts.	No. of Districts.
January	127	10
February	104	3
March	213	Nil
April	2	1
May	Nil	2
June	14	255
July	Nil	152
August	Nil	62
September	1	16
October	1	7
November	22	Nil
December	29	5
	513	513

AGRICULTURAL PRODUCTION OF SOUTH AFRICA.

Although the great bulk of the value of South Africa's production of primary products is derived from gold, large quantities of primary rural products of fairly high aggregate value are also raised each year, of which the principal items are wool, fresh fruits, sheep skins, hides, maize, meat, mohair, and wine. The value of the total exports from the country is about £75,000,000, of which about £48,000,000 are derived from gold and a little over £22,000,000 from produce of the land. Some of the details of agricultural production and exports are set out in the next two tables, which give an idea of the relative importance of the various rural activities of the country:—

Production and Exports of Principal Crops of South Africa.

Crop.	Production.			Exports in 1932-33.
	1911.	1921.	1930.	
	Tons.	Tons.	Tons.	Tons.
Maize	863,000	1,335,000	2,239,000	268,232
Kaffir Corn	155,000	155,000	177,000	14
Wheat	181,000	228,000	328,000	Importer
Oats	155,000	96,000	151,000	247
Barley	31,000	26,000	53,000	27
Potatoes	92,000	112,000	173,000	2,885
Tobacco	7,000	8,000	6,000	34
Sugar	82,000	144,000	299,000	146,228
Dried Grapes	1,127	7,036	4,295	4,690*
Dried Fruits (other)	—	2,973	5,720	2,641*
Wine—Gallons	7,501,000	16,945,000	15,899,000	888,875†
Brandy and Spirits—Gallons	1,318,000	2,803,914	2,835,555	34,372†
Fresh Fruits—				
Grapes	—	—	—	21,773
Pears	—	—	—	14,560
Plums	—	—	—	8,645
Peaches	—	—	—	5,660
Apples	—	—	—	3,160
Other	—	—	—	1,499
Citrus	—	—	—	130,230*
Wattle Bark	—	—	—	63,537
Wattle Bark Extract	—	—	—	20,939
Cotton (Raw)	—	—	—	518

* 1933. † Gallons.

Production and Export of Livestock of South Africa.

Animal.	Livestock.			Export of Products, 1932-33.
	1911.	1921.	1930.	
	No.	No.	No.	Tons.
Horses	719,000	920,000	868,000	—
Cattle	5,797,000	8,557,000	10,751,000	—
Sheep	30,657,000	31,730,000	48,520,000	—
Pigs	1,082,000	915,000	963,000	—
Goats	11,763,000	7,837,000	7,995,000	—
Mules and Asses	431,000	839,000	881,000	—
Ostriches	747,000	262,000	33,000	—
Fowls	—	—	8,089,968	—
Ducks	—	—	291,192	—
Turkeys	—	—	242,472	—
Geese	—	—	154,946	—
Wool (greasy)	—	—	—	183,599
Wool (other)	—	—	—	2,731
Beef	—	—	—	7,273
Bacon, Hams, and Lard	—	—	—	131
Meats (other)	—	—	—	112
Sheep Skins	—	—	—	17,131
Goat Skins	—	—	—	1,482
Hides	—	—	—	8,290
Mohair	—	—	—	2,873
Ostrich Feathers	—	—	—	21
Eggs—Dozens	—	—	—	5,396,160*
Cheese	—	—	—	993
Butter	—	—	—	1,929

* Dozens.

THE IMPORTANT CROPS OF SOUTH AFRICA.

Agriculturally, South Africa is largely a grazing country, nevertheless she maintains her population with home-grown crops, with a slight deficiency of wheat, which is more than compensated for by exports of other vegetable foodstuffs, and with intensive farming crops, such as fruits and grapes for wine, she is making steady and continuous progress. At present the crops of outstanding importance in the Union are maize, sugar cane, grapes, pears, plums, peaches, and citrus fruits, and the yields of all of these crops can be increased to a considerable degree by bringing new areas under the various crops, and improving the cultural methods.

Maize in South Africa.

Without doubt maize is the most important crop of South Africa, being grown over a greater area than others, is more widespread throughout the Union, and is the staple foodstuff of the native and poorer European portions of the population. So important as a foodstuff is maize that from 1,100,000 to 1,200,000 tons of grain are used annually.

South African maize has a good name in those countries to which it is exported, and this appears to be largely due to the fact that the weather during the ripening period is such that the harvested grain is relatively dry, and so it transports well and is very suitable for manufacturing purposes.

Production of Maize in South Africa.

Year.	Total Production.	Imports (net).	Local Consumption.	Exports of Maize Grown in South Africa.
	Tons.	Tons.	Tons.	Tons.
1910-11	770,760	651	644,010	127,401
1915-16	967,433	875	822,283	146,025
1920-21	1,191,717	11,531	1,006,176	197,072
1925-26	974,992	24,490	866,062	133,420
1930-31	1,429,286	23	1,266,500	162,809
1931-32	1,699,464	3	1,458,895	240,572
1932-33	744,734	29,763	665,135	109,362
1933-34	1,651,786*	—	1,150,000*	—

* Estimated.

[*From "Farming in South Africa."*]

A Well-Cared For Crop of a New Variety of Maize.

Maize is easily the most important crop of South Africa, and much work is being done by plant-breeders in several localities in the Union to produce improved varieties for each particular maize-growing district..

Most of the maize crops of the Union are grown in Transvaal and Orange Free State, and the conditions of the principal maize-growing districts are admirably suited to the crop, the soils being from good to excellent, the rainfall sufficient, and the temperatures high and regular enough. Quite considerable areas yield over 10 bags per acre when the seasons are normal, and it is not a bit unusual for farmers to average 15 bags per acre over their whole crop.

Export of Maize.

Most of the maize exported, and some which is used for local consumption, passes through the grain elevators provided for the purpose in 1924. The exports are all controlled by Government inspectors, who grade all parcels submitted, and issue Government certificates which are accepted by overseas buyers with confidence. So much maize passes through South Africa from neighbouring countries that the elevators handle for export a good deal more than the locally grown export grain, and since the inauguration of bulk handling the following quantities have been handled by the elevators:—

Handling Maize in South Africa's Elevator System.

Season.	Exported.	Local Consumption.	Total.
	Tons.	Tons.	Tons.
1924-25	45,040	30,439	75,479
1925-26	445,940	70,711	516,651
1926-27	14,741	103,563	118,304
1927-28	248,285	31,317	279,602
1928-29	341,933	83,067	425,000
1929-30	255,149	82,851	338,000
1930-31	438,566	132,612	571,178
1931-32	220,996	155,976	376,972
1932-33	311,826	170,574	482,400
Average of nine seasons	258,053	95,679	353,732

Wheat Growing in South Africa.

The production of wheat is the one agricultural activity which has a great attraction for most Europeans when they set about crop growing, no matter whether the natural conditions are suitable or not, and great efforts are often made to become self-contained in so far as wheat is concerned, even when more suitable crops are neglected. This is the case with South Africa as with so many other countries, but a study of the incidence of the rainfall, and a knowledge of the limited proportion of good soil where sufficient winter rainfall is received to suit wheatgrowing, shows how difficult of attainment this self-sufficiency with wheat is likely to be in the Union.

With restrictions on the importation of wheat and flour to the extent of bringing the cost of imported wheat to 6s. 9d. sterling per bushel, and a promise from millers to pay this figure to farmers for home-grown wheat, for one season, 1931-32, sufficient wheat was grown to supply all local needs, but despite this enormous increase in price above world parity, the need for importations of wheat persists.

Even with the high artificial price, the low yields obtained, due to unsuitable climatic conditions, damage by rust, and the existence of only moderate-quality soils, render wheatgrowing in much of the Union an uneconomic proposition.

Quite a fair amount of wheat is grown under irrigation, and this form of farming has been developed to a considerable extent of recent years with the locking of streams and the reclamation of river lands, but as the population grows, other more valuable irrigation crops than wheat will assuredly be grown.

Production of Wheat in South Africa.

Year.	Area Harvested.	Yield per Acre.	Total Yield.	Local Consumption.
	Acres.	Bush.	Bush.	Bush.
1927	793,539	7·2	5,674,617	12,739,950
1928	845,514	8·6	7,238,290	14,011,550
1929	1,111,839	9·6	10,625,537	14,699,483
1930	1,297,660	7·2	9,296,667	12,537,583
1931	1,779,400	7·7	13,713,333	16,174,183
1932	1,568,910	6·7	10,626,667	11,194,467
1933	1,288,980	7·9	10,226,667	—

FRUIT AND WINE IN SOUTH AFRICA.

The production of fruit and wine has rapidly become very important in South Africa, and this largely because of the great care exercised in preparing the articles for the export markets. This effort to capture and retain a market has been particularly successful where soft fruits are concerned, and fruits from the Union, and notably grapes, plums, and peaches, are said to open up in the British markets in as good a condition at least, as similar fruits from any other country sending them to Great Britain. That the progress made in the industry has been great in the past 20 years or so can be seen in the next table, where the number of trees from which fruit is picked for sale is set out for the two seasons 1911 and 1930:—

Commercial Fruit Trees in South Africa.

Kind of Fruit.	Commercial Fruit Trees. 1911.	Commercial Fruit Trees. 1930.
	No.	No.
Apple	1,429,858	2,464,370
Pear	650,937	1,009,740
Plums	635,646	1,379,250
Peach	5,902,480	3,590,670
Nectarine	98,687	76,420
Apricot	1,025,193	2,190,820
Orange	985,602	3,883,350
Lemon	172,856	196,890
Mandarin	404,189	272,260
Mango	*96,685	230,840
Other fruits	602,020	1,792,570
Vines, acres	*48,358†	76,896†

* 1918. † Acres.

The figures disclose a great increase in all kinds of fruits except peaches, nectarines, and mandarines, and as planting of new orchards of most other kinds is being continued each year, a further increase in production will be seen in the future.

Shipping Fresh Fruits to Europe.

Most of the fresh fruits, with the exception of citrus, are shipped from Capetown, and the arrangements for cooling and handling the fruit are really good, only that the quantities being handled have increased so rapidly that some congestion results in the busiest part of the season. The work of pre-cooling, cold storage, and loading of boats is expeditiously carried out with the minimum of hand labour, and very little double handling of the boxed fruit. Practically all fruit to be exported comes from within 110 miles of the port, and for the short journey, specially cooled railway vans are unnecessary, and ordinary louvred vans fulfil all requirements. On arrival by railway the boxes of fruit are stacked on trucks with wheels so small that the bottoms of the trucks are only a few inches off the ground, and so stacked that the labelled ends of all boxes are visible. The trucks have room for five rows of boxes, but the boxes for the centre row are stacked on top of the other four rows until the inspection is completed, and the labelled ends of boxes have been marked to show they have been passed by an inspector. The boxes in outside rows have labels facing outwards, whilst those in the second rows have their labels facing the alley-way where the middle row is to be stacked. As soon as the inspection is completed the surplus boxes on the four rows are stacked in the alley-way on the truck left for the purpose, and this small job is the only one in which there is any second handling of the boxed fruit, from the time it is taken from the railway trucks until stacked in the ship's hold. As soon as the inspection and branding is completed a small electric motor hooks on to the truck loaded with fruit and hauls it into the pre-cooling chamber, where it is left until the temperature has been brought sufficiently low, when it is again connected to a motor which takes it to the cool stores, to remain until a boat is ready to receive the fruit. The Cold Stores at Capetown consists of a four-storey concrete building which runs the whole length of a long wharf, the top two stories being continuous, but the ground and first floors are broken in several places with wide openings, to admit of all kinds of traffic from the land to the side of the ships. The non-continuous floors consist of the pre-cooling chambers, whilst the top floors are the cold stores where temperatures are lowered to the ideal for holding the particular kind of fruits being exported at the time. Fruit that has to be taken from any floor to one that is higher is hauled by an electric motor to a lift in the close vicinity, the truck containing the boxes of fruit is pushed on to the lift by the motor, and on arrival at its destination a similar motor hooks on to the truck and takes it to the chamber where it is to be stored.

An Orchard of Young Fruit Trees.
South Africa is an important producer and exporter of fruits of most kinds, and not only grows the fruits well, but prepares them for the overseas markets so efficiently that they open up in Great Britain in as good, if not better, condition than the same kinds of fruit sent from other countries.

The chambers of the cold stores have doors on the inside which open to admit the trucks of fruit, and doors on the wharf side to allow the pushing of the trucks on to a platform outside of each doorway, from which the travelling wharf-crane picks up truck and all and lowers it down the ship's hold. This putting of the truck loads of fruit into one side of the cool chambers and out the other side, and right into the hold of the ship is done with the minimum of labour, and perhaps of more than equal importance, with the least possible change of temperature.

This method of handling fruit from railway truck to ship's cool chambers can only be carried out efficiently when plenty of lifts are available of sufficient size to take at least one truck and its load, from one floor to the other with some speed.

The handling of export fruit is facilitated in South Africa by the insistence on the use of a specified coloured wooden cleat on the boxes for every different kind of fruit, no matter in what part of the Union the fruit is packed. For instance, all boxes of grapes have blue cleats, pears have green, and so on for every different kind of fruit, and the convenience of knowing what is inside the boxes by the bright colours of the cleats is a great one indeed, particularly when it becomes necessary to use unskilled labour in shifting consignments.

To reduce the congestion at the Capetown Cold Stores inspectors are sent into the more important country fruit-growing centres to inspect and pass fruit for export at the packing sheds. This appears to have served its purpose fairly well, and gratifies country dwellers quite a lot.

Barges as Cool Stores.

Port Elizabeth is an important shipping port for citrus fruits, and from this place about 800,000 cases of these fruits were shipped last year, and it was estimated that the amount would be increased to 1,000,000 cases this season. The port is only in the making, and until further breakwaters and wharves are completed, temporary arrangements for the handling of fruit for export have been made, and the method adopted appears to be excellent for the cooling and holding of perishable foodstuffs for partly developed shipping centres. The refrigeration plant is located on the jetty, and the cooling chambers consist of insulated barges tied nearby. In Port Elizabeth, 19 barges are insulated for the purpose, and by pumping cooled brine from the plant on the jetty to the barges, and passing air over the tubes to the boxes of fruit, temperatures from 30° F. to 34° F. are easy to maintain until the fruit is shipped.

Research Work on Cold Storage.

Although South Africa has been so successful in the preparation for marketing, and the delivery in Europe in really good order of her perishable products, she intends to improve still further the methods of packing and cooling, and for the purpose is undertaking considerable research work on the matter. An up-to-date Cool-storage Research Laboratory is rapidly approaching completion in Capetown, and when finished should admit of the carrying out of work of a more accurate nature than was possible in the past, and should be strictly comparable to commercial practices. The building and equipment was sufficiently advanced to occupy it in December, 1934, and detailed and careful work on the wastage of fruits has been conducted throughout the fruit season. Fruit has been kept at various temperatures, between the known ranges of temperature for each fruit, for the maximum time any South African fruit would be held, which is 25 days, and then for a further 10 days at store temperatures to cover the selling period, and after the full time was up a detailed examination was made of the fruit.

Provision is being made in the laboratory for conducting extensive tests with gases such as nitrogen, carbonic acid gas, and oxygen, and the results should be of the utmost interest to all people dependent upon cold storage to market their products.

Field Work with Fruit.

Because of the importance of the fruitgrowing industry, and the recognition of the possibilities of expanding it, the South African Department of Agriculture is doing a considerable amount of research work on all phases of horticulture. In the south-west portions of the country, gardens are maintained for investigating the problems connected with deciduous fruits and vines, whilst in the warmer climate of the sub-tropical zone, citrus and tropical fruits are experimented with.

Of the less well-known fruits, it is recognised in the Union that the paw-paw is becoming increasingly popular, and that some day it will be one of the very important fruits of the world, and consequently work in connection with the improvement of this fruit is being undertaken on a fairly considerable scale. At the Nelspruit Horticultural Experiment Station the work has progressed so far that a great improvement in the shape of the fruits has already been brought about, and as shape appears as a fixed character in the breeding work conducted at the above institution, it seems that one of the principal packing troubles experienced with paw-paws is likely to be definitely overcome in the near future. There are also indications that tougher skins can be obtained on good-shaped fruits without sacrificing quality of flesh, and if this proves to be so, the marketing scope of this popular fruit will be considerably extended.

[*From "Farming in South Africa."*]

A Grove of Paw-Paw Trees in Fruit.
On present appearances the Paw-paw is likely to become one of the very important fruits of the world, and this is recognised in South Africa to the extent that considerable work is being carried out towards breeding types of fruit of improved shape, and with better carrying properties.

Varieties of Fruit Grown for Export.

A really large assortment of varieties of all the various kinds of fruits are exported, but with each kind a few predominate, and only very small quantities of most other varieties are shipped out of the country. The relative importance for export of the different fruits, and the different varieties of fruit, are shown below for the season 1932-33:—

Importance of Various Fruits (Non-citrus) Exported from South Africa in 1932-33.

Fruit.	Tons (40 cub. ft.).	Percentage.
Grapes	21,773	39·4
Pears	14,560	26·3
Plums (and prunes)	8,645	15·6
Peaches	5,660	10·2
Apples	3,160	5·7
Nectarines	676	1·2
Melons	326	0·6
Apricots	322	0·6
Mangoes	61	0·1
Grenadillas	36	0·1
All others	78	0·2

Principal Varieties Exported from South Africa in 1932-33.

Kind and Variety.	Tons (40 cub. ft.).	Percentage.
Grapes—		
Waltham Cross	5,569	25·6
Hanepoot White	2,543	11·7
Almeria	2,107	9·6
Hanepoot Red	2,019	9·3
Gros Colman	1,713	7·9
Henab Turki	1,644	7·5
Barlinka	1,642	7·5
Raisin Blanc	1,376	6·3
Prune de Cazouls	786	3·6
Alphonse la Vallée	544	2·5
Hermitage	489	2·2
Rosaki	409	1·9
Gros Noir	166	0·7
Barbarossa	137	0·6
Red Emperor	129	0·6
Flame Tokay	116	0·5
Molinera Gorda	113	0·5
Twenty-one other varieties	Less than 100 tons	—
Pears—		
Winter Nelis	2,353	16·2
Bon Chretien	2,314	15·9
Beurre Bosc	1,957	13·4
Keiffer	1,636	11·2
Doyenne du Comice	1,445	9·9
Glou Morceau	1,264	8·7
Josephine	1,169	8·0
Louise Bonne	901	6·2
Beurre Hardy	681	4·7
Beurre Diel	266	1·8
Clapps Favorite	230	1·6
Forelle	182	1·2
Sixteen other varieties	Less than 100 tons	—
Plums—		
Santa Rosa	2,934	33·9
Kelsey	2,457	28·4
Gaviota	982	11·4
Wickson	725	8·4
Prunes	526	6·1
Beauty	276	3·2
Methley	189	2·2
Satsuma	166	1·9
Apple	156	1·8
Eighteen other varieties	Less than 100 tons	—
Peaches—		
Peregrine	1,902	33·6
Elberta	955	16·9
Inkoos	772	13·6
Pucelle	637	11·2
Duke of York	514	9·0
Cape Freestone	255	4·5
Early Alexander	242	4·2
Schoongezicht	107	1·9
Twenty-one other varieties	Less than 100 tons	—
Apples—		
Dunn's Seedling	1,456	46·1
Ohenimuri	652	20·6
White Winter Pearmain	279	8·8
Delicious	227	7·2
Jonathan	127	4·0
Thirty-four other varities	Less than 100 tons	—

Principal Varieties Exported from South Africa in 1932-33—continued.

Kind and Variety.	Tons (40 cub. ft.).	Percentage.
Nectarines—		
Goldmine	563	83·3
Early Rivers	97	14·3
Six other varieties	Less than 10 tons	—
Apricots		
Royal	233	72·3
Cape	80	24·8
Four other varieties	Less than 10 tons	–

Citrus Fruits in South Africa.

There has been a fairly considerable increase in the production and export of citrus fruits in the Union, but of more importance than the increased quantities being handled is that a marked improvement has been accomplished in the quality of the fruit produced for export. Oranges and grapefruit are a good deal more important now than a few years ago, whilst lemons do not show much of an increase, and there has been a noticeable reduction in the number of mandarin trees. So much research work in connection with citrus culture is being conducted in South Africa, in the field and in the preparation of the fruit for marketing, that these fruits must prove increasingly valuable to the country, because the climatic conditions are favourable, and there is still some water to be controlled for irrigation, sufficiently close to suitable localities to render the growth of oranges and grapefruit successful.

[*From "Farming in South Africa."*]

An Orange Grove in South Africa during the Course of an Irrigation.

There has been a great increase in the area planted to oranges in South Africa of recent years, and most of the groves are located where irrigation water is available. Of other citrus fruits, there has been a regular and considerable increase in the quantities of grape-fruit exported overseas from the Union.

Number of Principal Citrus Trees in South Africa.†

Year.	Orange.	Mandarin.	Lemon.	Total.
	No.	No.	No.	No.
1911	985,601	404,189	172,856	1,562,646
1918	1,825,642	441,904	248,336	2,515,882
1921	1,810,990	376,080	160,710	2,347,780
1924	2,959,790	321,180	225,950	3,506,920
1925	3,559,280	341,900	270,540	4,171,720
1926*	3,633,130	307,340	192,920	4,133,390
1930*	3,883,350	272,260	196,890	4,352,500

* Trees, the produce of which is grown for sale.
† Official Year Book of the Union of South Africa, 1932-33.

Exports of Citrus Fruits from South Africa.†

Fruit.	1930.	1931.	1932.	1933.
	Tons.	Tons.	Tons.	Tons.
Oranges	106,096	91,734	100,276	113,832
Grape Fruit	5,826	7,864	8,870	14,664
Mandarins	557	649	564	531
Lemons	275	298	1,463	1,203
Total, tons	112,754	100,545	111,173	130,230
Total, boxes	2,009,988	1,786,993	1,978,328	2,316,093

NOTE.—One shipping ton of 40 cubic feet equals approximately 17¾ standard citrus boxes.
† Official Year Book of the Union of South Africa, 1932-33.

Varieties of Citrus Fruits Grown for Export.

Valencia and Navel oranges are easily the most important citrus fruits exported from the Union, but quite a number of varieties of the various kinds are put on the overseas markets, the principal ones of which are shown in the next table for the year 1933:—

*Principal Varieties of Citrus Fruits Exported in 1933.**

Variety.	Shipping Tons of 40 cubic feet.
	Tons.
Valencia	55,083
Navel	44,510
Grape Fruit	14,664
Seedling Orange	10,182
Du Roi	1,883
Lemons	1,023
Jaffa	822
Mediterranean Sweet	765
Mandarins	530
Joppa	269
Seville	200
Pineapple Seedling	137
St. Michael	82
Maltese Blood	63
Lew Gim Gong	17
Total exported in 1933	130,230

* Fruit Production in the Union—Report No. 16.

The Wine Industry of South Africa.

The wine industry of South Africa has a long history, for vines were introduced into the country in 1653, and shortly afterwards the first Governor of that part of the world, Van der Stel, imported further consignments from France, Germany, and Portugal. The production of wines grew apace, and was of fairly considerable proportions when Phylloxera was discovered to be in the country in 1886. Some years were spent in attempting to control the pest, but it was found necessary to import American vines in 1892, and the vineyards were reconstituted on American stocks, and a fresh start was made to develop the industry. The good name earned for some of the wines of earlier days was inevitably lost when it became necessary to replant vineyards with grafted vines, but great efforts are now being put forth to bring some of them into prominence once again. In the meantime good usable wines are being exported in fairly considerable quantities, and the development of the trade has been quite rapid since the industry made its second start. In 1910 there were exported 76,982galls. of wine, which was increased to 518,223galls. by 1920, was further extended to 695,231galls. in 1930, and it was estimated that it would considerably exceed 1,000,000galls. in 1934.

Portion of the Wine Cellars of the Co-operative Winegrowers' Association of South Africa Over 95 per cent. of farmers growing grapes for conversion into wine belong to this Association, which has absolute control over all wines declared as distilling wine.

When the industry was struggling to make progress after its severe setback, the Government provided loans to finance co-operative wineries, and of the nine established in 1905 or thereabouts, seven are still in existence, and are apparently doing well.

The wine industry was very depressed again in 1917, and to help themselves out of the trouble winemakers formed themselves into an association which is still in existence, and is functioning very vigorously The official Year Book of the Union of South Africa for 1932-33 describes this organisation as follows:—"Towards the end of 1917, owing to the depression in the wine market, the Ko-operatieve Wijnbouwers Vereniging van Zuid-Afrika Beperkt was formed. Over 95 per cent. of the wine farmers joined this association, and a board of directors, appointed by the members, now fixes yearly the prices for wine.

In 1924 the Wine and Spirits Control Act (No. 5 of 1924) was passed, which gave the association absolute control over all wines declared by the producer as distilling wine, whether belonging to a member or a non-member. Every winegrower in the Cape Province renders to the association on a certain date each year a return of all wines, spirits, and brandy produced by him, and states what quantity he has for disposal for consumption as wine, and what quantity he has for sale as distilling wine. The price the farmer gets for distilling wine is each year fixed by the board of directors.

For every leaguer of wine sold by a member the association deducts 10s. for three years, and for every amount so deducted the member receives a share in the association. The intention is that the fund created should be used by the association when necessary to deal with any surplus wine which may be on the market, the association buying these wines at the minimum price, and after they have been turned into spirits, disposing of them outside the Union.

In 1926 the Ko-operatieve Wijnbouwers Vereniging started to export wines themselves, and are to-day the biggest exporters. In order to safeguard the industry and ensure that the quality exported would be of a high standard, the Government brought a regulation into force in 1924 which stipulated that dry wines should be at least 16 months old before export, but sweet wines may be exported at any age, subject to a certificate by the Government Viticulturist that they are fit for export."

The exports by the association have grown from year to year, and have attained considerable dimensions for wine, brandy, and grape juice, as can be seen from following table:—

Exports by the Co-operative Winegrowers Association.

Year.	Great Britain.	Europe.	Canada.	Other Countries.	Total.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Wine—					
1926	15,707	10,397	—	—	26,104
1927	133,080	12,062	—	—	145,142
1928	188,857	16,287	—	—	205,144
1929	322,311	16,615	—	—	338,926
1930	485,177	24,621	—	1,981	511,779
1931	600,687	20,039	12,442	330	633,498
1932	617,209	25,871	14,806	408	658,294
	Proof Gals.	Proof Gals.	Proof Gals.	Proof Gals.	Proof Gals.
Brandy—					
1930	639·6	—	—	—	639·6
1931	5,165·6	—	—	—	5,165·6
1932	4,723·0	—	—	722·6	5,445·6
	Gallons.				
Grape-syrup—					
1927	70,291	—	—	—	—
1928	103,488	—	—	—	—
1929	106,445	—	—	—	—
1930	68,410	—	—	—	—
1931	*	—	—	—	—
1932	44,800	—	—	—	—
1933	214,054	—	—	—	—

* Withdrawn from Market.

The factories under the direct control of the Co-operative Winegrowers' Association of South Africa are located at:—

1. Paarl, where the laboratory and administrative offices are situated, and where the manufactures are fortifying spirit, potstill brandy, blended wine for

export, Eau de Cologne, lavender water, bay rum, gins, vermouths, cocktails, liqueurs, and unfermented grape juice. The capacity of the stills is 6,000 proof gallons per day.

2. Stellenbosch, where fortifying spirit, potstill brandy, wine, and concentrated grape juice are made. The capacity of the stills is 4,000 proof gallons per day.

3. Worcester, where fortifying spirit, potstill brandy, wine, and concentrated grape juice are manufactured. The stills have a capacity of 5,000 proof gallons per day.

4. Robertson, where fortifying spirit, potstill brandy, and wine are made. The capacity of the stills is 4,000 proof gallons per day.

5. Montagu, where fortifying spirit, potstill brandy, and wine are made. The capacity of the stills is 2,000 proof gallons per day.

To help sell the wines of the association the South African Wine Farmers' Association (London), Ltd., was established, in which the association has a half interest, and to this selling organisation all of the wines for the United Kingdom are consigned for distribution. Bonded stores have been opened in several British ports for inspection of wines on arrival and attention if necessary. In London, wine cellars are occupied with modern chilling, fining, filtering, and bottling equipment.

Production of Wine and Brandy in South Africa.

Once the setback to the industry caused by the attacks of Phylloxera was overcome, fairly rapid progress in vine growing has taken place, and hand in hand with the production of wine and brandy has gone the increased production of raisins and currants. The quantity of wine made remained around about the 6,000,000-gall. mark for some years, but in the last 25 years has been brought fairly close to an annual production of about 16,000,000galls. In the next table the production and export of wines and brandy are set out, but unfortunately the last official figures shown for the production of wine are for the year 1930, and not for 1932, as is the case with the other figures:—

Production and Disposal of Wine and Brandy in South Africa.¶

Year.	Wine.			Brandy.	
	Production.	Exported.	Value of Wine Exported.	Production.	Exported.
	Gallons.	Gallons.	Per Gallon. s. d.	Gallons.	Gallons.
1891	6,013,000	—	--	—	—
1896	5,687,000	-	-	-—	—
1904	5,687,000	-	---		-
1910	*7,501,000	76,982	4 9	1,318,021	35,910
1915	†11,731,000	99,842	5 4	1,662,968	37,558
1921	16,945,000	404,099	5 3	2,803,914	50,381
1926	13,230,479	240,481	4 2	1,779,269	43,641
1932	‡15,899,130	888,875	2 9	2,835,555	34,372

* 1911. † 1918. ‡ 1930.

¶ Official Year Book of the Union of South Africa, 1932 33.

Varieties of Grapes Grown for Winemaking.

As is to be expected a very large assortment of varieties of grapes are grown for wine making in South Africa, but the principal kinds are Steen, Green Grape, White French, Hanepoot, Hermitage, Cabernet Sauvignon, Red Muscadel, and White Muscadel. Besides these Shiraz, Merlot, Malbec, and many others are grown to a lesser extent.

Brandy is distilled from the wine made from all the wine grapes, but the varieties Folle Blanche, Colombard, St. Emilion, and Jurancon are grown almost solely for the production of brandy.

Raisins and Currants in South Africa.

Raisins have been an important agricultural production of the Union for a considerable time, but it is only of recent years that currants have come into prominence, for it was not until 1916 that the Zante currant was introduced into the country.

Production and Exportation of Dried Grapes in South Africa.

Year.	Produced on Farms.			Exports.
	Sultanas.	Total Raisins (including Sultanas).	Currants.	
	Tons.	Tons.	Tons.	Tons.
1911	70	1,122	5	—
1918	513	2,889	51	—
1921	864	3,747	35	3,118
1926	1,393	4,075	81	2,211
1930	1,339	4,019	275	700
1931	—	—	—	2,859*
1932	—	—	—	2,914*

* Including Currants.

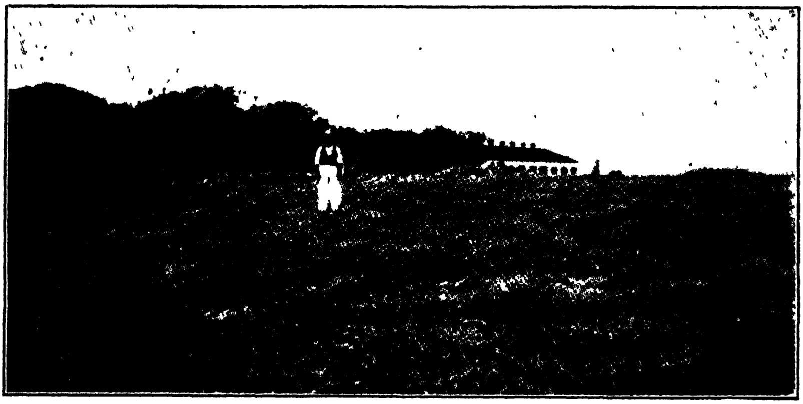
[*From "The Grasslands of South Africa."*]

Prinzhof Experiment Station at Pretoria, where much of the field experiment work in connection with the establishment and management of pasture plants is being conducted.

Throughout the Union pasture experiments are being conducted in an effort to raise the nutritive value of the pastures, as well as to increase their livestock-carrying capacity.

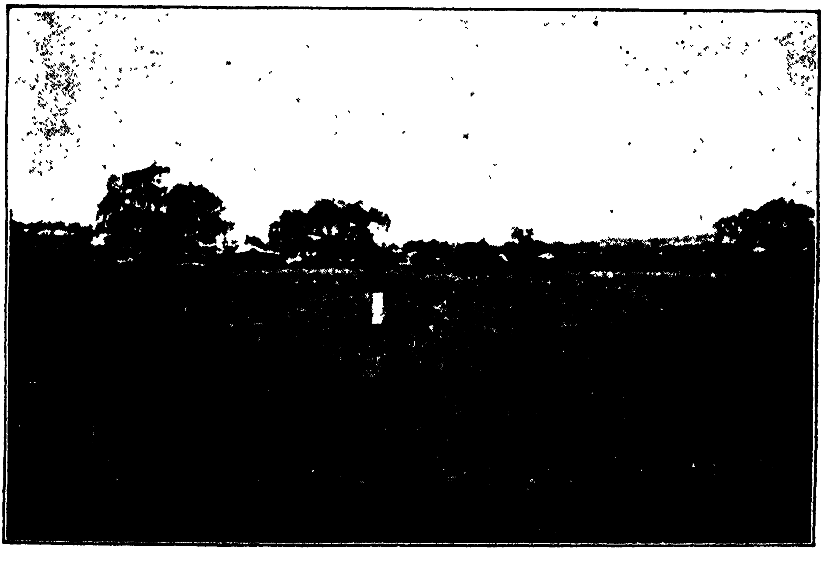
THE PASTURES OF SOUTH AFRICA.

Such a relatively small proportion of the area of South Africa is suitable for arable farming that pastures must always be of the utmost importance, and although the climatic conditions of much of the Union are not ideally suited to the production of first-class pastures, a large portion of the country has sufficiently good climate to favour the growth of forage plants, and to make it appear possible that really good pastures can be maintained. At present the position appears to be that although: (*a*) such a high percentage of the primary rural products exported from the Union are obtained from pastures; (*b*) it is estimated that more than 80 per cent. of the total area is unsuitable for other forms of agriculture; and (*c*) pasture grasses grow very strongly in many districts, there are relatively few really good pastures in South Africa. This fact is generally recognised nowadays, and strenuous efforts are being made to overcome the existing difficulties, and to educate and encourage livestock farmers to improve their pastures. Most agricultural publications of the Union deal with pasture improvement questions frequently, and draw attention to the poor management, the rela-



[*From "The Grasslands of South Africa."*]

A Three Months' Old Stand of Kikuyu Grass in Natal.
Kikuyu Grass makes prolific growth in the sub-tropics where there is plenty of moisture, and as well as being a very succulent grass, is remarkably palatable to all farm livestock



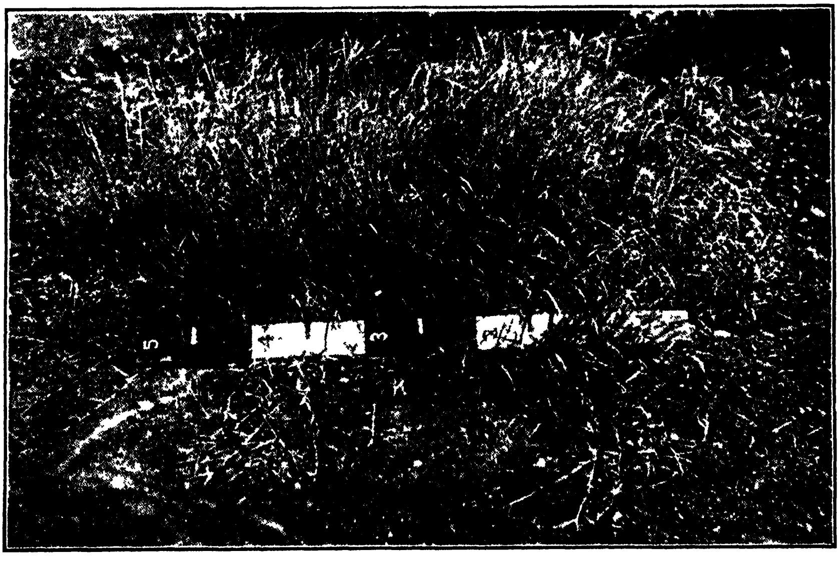
[*From "Agricultural Grasses of South Africa and Management of Their Pastures"*]

A Crop of Rhodes Grass.
Indigenous to the country, Rhodes Grass does really well in most districts of South Africa, where spring and summer rainfall is the rule.

tive fewness of the animals carried, and the low quality of so much of the grazing livestock. The farmer is generally blamed for overstocking and too frequent burning of his pastures, and in all probability some of the soil erosion so common in the country, and the relatively low livestock-carrying capacity of many pastures are due to these forms of mismanagement, but there is a livestock-maintaining limitation of the indigenous pastures that is only just becoming understood, and the correction of the deficiencies is yet to be discovered for many localities. The protein deficiency of the native grasses during certain periods of their growth, the shortage of phosphorus and lime, the tendency for grasses when grazed to become tussocky and be surrounded by bare soil, and the liability of the eradication of good species of grasses, are happenings to be expected in sub tropical conditions where the soils are fairly poor, and are difficult of correction.

Indigenous Grasses.

South Africa is very rich in indigenous grasses which provide heavy yields of forage, and an enormous amount of research work is being conducted by the Department of Agriculture and the Faculties of Agriculture of the various Universities in the Union, to understand the handling of the various kinds to full advantage, and in learning what are their various requirements in so far as natural conditions are concerned.



[From "Agricultural Grasses of South Africa and Management of Their Pastures."]

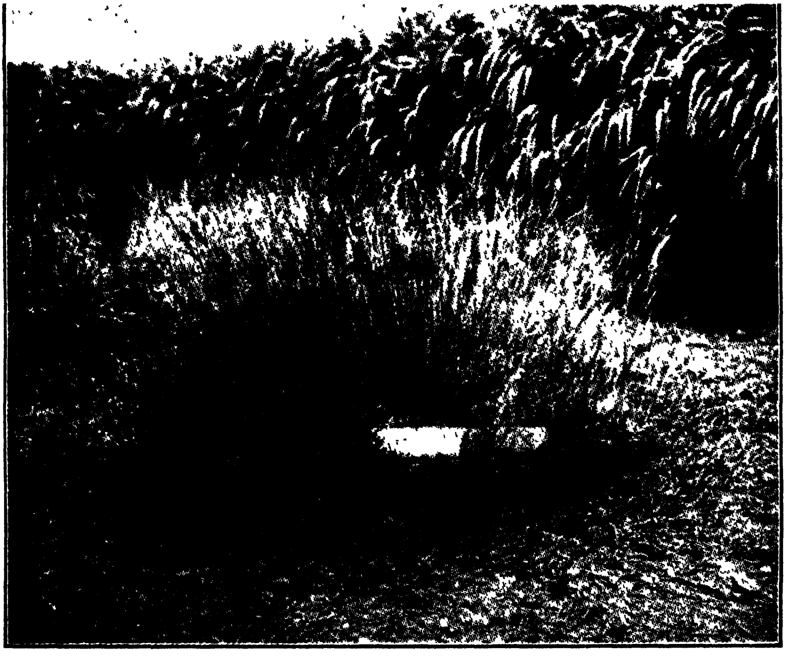
Lowveld Finger Grass (*Digitaria decumbens*).

There is a very large collection of Finger grasses (*Digitaria spp.*) indigenous to South Africa, and several of them are really useful pasture grasses. One of the principal activities of the Pasture Section of the Department of Agriculture is the propagation of all the useful *Digitarias* obtainable, and their segregation into all possible types, and very promising results are being secured from these grasses.

Two of the most useful indigenous grasses for improving pastures in particular localities are Kikuyu and Rhodes, the former requiring plenty of rain or moist locations, but the latter is a good deal hardier in this direction. Of others, one of the most palatable of the strong-growing grasses is Rooigrass (*Themeda triandra*), which is also indigenous to Australia, where it is known as Kangaroo grass. So palatable is this grass in South Africa that it is readily eaten out of the pastures if overstocked, when *Eragrostis, Aristida,* and still poorer grasses take its place.

Of the hundreds of species of indigenous grasses being tested some of the most promising are:—

Echinochloa pyramidalis (Libpopo grass).
Echinochloa sp., Nata River strain.
Sorghum verticilliflorum.
Sorghum fulvum.
Digitaria pentzii (Woolly Finger grass).
Digitaria decumbens (Lowveld Finger grass).
Digitaria sp., Pongola River strain.
Setaria splendida.
Panicum muticum.
Panicum repens.
Acroserus macrum.
Pennisetum ciliaris (Droëlands grass).



[*From "Farming in South Africa."*]

N'hamba Strain of Finger Grass (*Digitaria* sp.).

The illustration shows very clearly the strong runners put out by this grass, which is typical of most of the ***Digitarias*****, and also the seedheads from which the name of "Finger grass" is derived.**

Of these grasses *Digitaria decumbens* (Lowveld Finger Grass) and *Digitaria* sp. (Pongola River strain) appear likely to be particularly good for the controlling of sand drifts, as they provide a lot of feed without much danger of leaving bare patches, unless flagrantly overstocked.

The successful propagation of all or any of the grasses so promising at present will not overcome the protein deficiency now so prevalent in the country, and good hardy legumes suitable for grazing are required to grow in association with the grasses, but the only one being handled which looks like becoming really useful is ***Trifolium africaner,*** which unfortunately has not yet been tested to any great extent.

Introduced Pasture Plants.

Only very few of the many introduced pasture plants have proved successful for large areas of country, and none of these is a European plant. Easily the most useful of the introductions is lucerne, which gives really heavy returns when grown with the aid of irrigation, and where the natural conditions are at all favourable produces very fair grazing crops without added water. Unfortunately most of the pasture land of South Africa is unsuitable for the growing of lucerne, and so there does not appear to be much chance of this wonderful pasture plant being utilised to make up the severe protein shortage common to much of the country.

Couch grass (*Cynodon dactylon*) appears in many countries of the world so may be indigenous to South Africa, but whether this is so, or whether it is introduced, it has spread considerably of recent years, and although a bad weed in cultivated fields is a very good pasture plant, particularly in sub-tropical conditions. In places where it grows freely there is little soil erosion, for it is only under the severest of overstocking that it becomes at all tussocky, and it usually binds the surface soil so well that neither washing nor drifting can take place. In many places where anti-soil erosion work has been completed, the distribution of the water over the surface, instead of allowing it to rush down the recently-formed creeks, has led to a great increase in the amount of *Cynodon* present, with its accompanying increase in grazing, and improved soil protection.

Bromus unioloides (Rescue or Prairie grass) is becoming prevalent in irrigation areas, where it is welcomed, but is not so well known where it is wholly dependent upon the rainfall.

Paspalum dilatatum is grown to some extent in the Union, and it is extremely hardy, but is not particularly popular.

In small plots under test *Paspalum notatum* appears as though it may prove very useful in South Africa, but it has not been tested sufficiently long, nor on large enough scale, for experimenters to forecast its future.

Spineless cactus, Old-man saltbush, and American aloe are grown in some of the lower rainfall parts of the country as reserves in time of drought, the former two being fed down by livestock, but the leaves of the aloes are taken from the plants, chopped up, and carted to the stock in times of feed shortage.

The Karroo.

A considerable area of country, most of which receives only light average annual rainfall, grows small bushes and herbs rather than grass, and is known in South Africa as The Karroo, in much the same manner as Australians speak of The Saltbush. This country, which gets from below 5in. to 25in. of rainfall on the average, is subject to droughts, but where care is shown proves very suitable to sheep farming. It is somewhat similar in appearance to saltbush country, except that the bushes are dark-green in colour, without the ashey-grey tinge of the salt and blue bushes. As in most low-rainfall country the soils are well provided with lime, and so it is fairly healthy country for those livestock which can thrive on bushes. Most parts of the Karroo consist of plains and flat-topped hills, the plains being fairly small and are scattered between steep, stony hills which carry relatively little growth and this is of poor feeding value. When carefully managed the bushes become interspersed with a nice sprinkling of grass, which adds variety to the grazing and improves the carrying capacity.

LIVESTOCK IN SOUTH AFRICA.

The production of crops to feed the populace is of the utmost importance to all countries, but is particularly so to one such as South Africa, where so high a proportion of the people are natives depending largely upon crops for their sustenance. Despite this fact the country has for centuries been a producer of domesticated livestock, and after it was occupied by Europeans the number of animals maintained was increased many times to supply the growing demand for meat for consumption, and then to provide a surplus for export. Such progress has been made in livestock management that wool is one of the most important of the exports of the Union, the overseas sales of eggs have reached important proportions, and various kinds of meat, frozen and chilled, are shipped with some regularity.

Sheep in South Africa.

Of South Africa's primary products gold is easily the most important, but next to this the sheep industry is far and away more valuable than any of the others. Even after the particularly severe drought of 1933, when about 7,000,000 sheep were lost, the Union continued to maintain about 40,000,000 sheep, of which number nearly 6,000,000 do not produce wool. The principal sheep product of value from the point of view of export is wool, and in good seasons something over 300,000,000lbs. of wool are exported.

Sheep in the Union, 1904 *to* 1933.

Year.	Woolled Sheep.	Other Sheep.	Total Sheep.
1904	11,820,635	4,501,868	16,322,503
1911	21,842,215	8,814,444	30,656,659
1921	27,757,213	3,972,299	31,729,512
1926	35,377,744	3,642,501	39,020,245
1931	44,017,000	5,760,000	49,777,000
1932	43,016,000	6,264,000	49,280,000
1933	40,371,000	5,720,000	46,091,000

The increase in numbers of sheep after 1904 was brought about very rapidly, with the total at its peak in 1931, and during the 27-year period the flocks were more than trebled, and the animals then present almost totalled 50,000,000. Although the production of meat for human consumption was becoming more and more important, the most of the increase in the numbers of sheep was with woolled sheep, and not so much so with those carrying hair instead of wool. Not only has the number of woolled sheep been increased, but better wool producers have been developed, and the amount of wool cut per sheep is a good deal higher than it was some few years ago.

Production of Wool in South Africa.

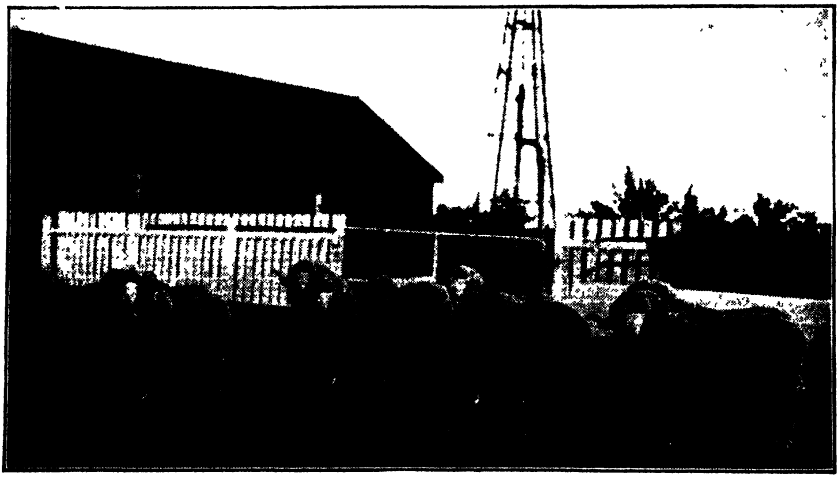
Year.	Woolled Sheep.	Wool.	
		Produced.	Exported.
	No.	Lbs.	Lbs.
1920-21	27,757,213	135,929,019	—
1921-22	26,091,320	140,052,949	—
1922-23	25,823,939	137,217,585	—
1923-24	27,084,491	147,865,493	—
1924-25	32,153,221	156,969,334	—
1925-26	35,377,744	167,921,510	—
1926-27	36,114,138	194,110,025	—
1927-28	38,350,707	216,924,103	—
1928-29	40,462,935	232,004,424	—
1929-30	44,020,677	249,442,062	—
1930-31	44,017,000	292,074,000	274,891,000 (*a*)
1931-32	43,016,000	304,529,000	291,187,000 (*b*)
1932-33	40,371,000	318,572,000	326,647,000 (*c*)
1933-34	—	273,917,000	235,209,000 (*d*)
1934-35	—	245,000,000*	—

* Estimated.

Wool exported 1931 to 1934, includes scoured wool—(*a*) 5,206,000lbs., (*b*) 4,739,000lbs. (*c*) 6,450,000lbs., and (*d*) 6,656,000lbs.

Merino Sheep in the Union.

It appears that Merino sheep were introduced to South Africa in the seventeenth century, but very little was done with the breed until fresh interest was taken in it with the introductions made in 1812. The early importations embraced the very best strains of the day, including Spanish (Negretti), Saxon, Rambouillet, and American, and had the same attention been given to them as was done in Australia the Union would have been farther advanced as a producer of fine wool

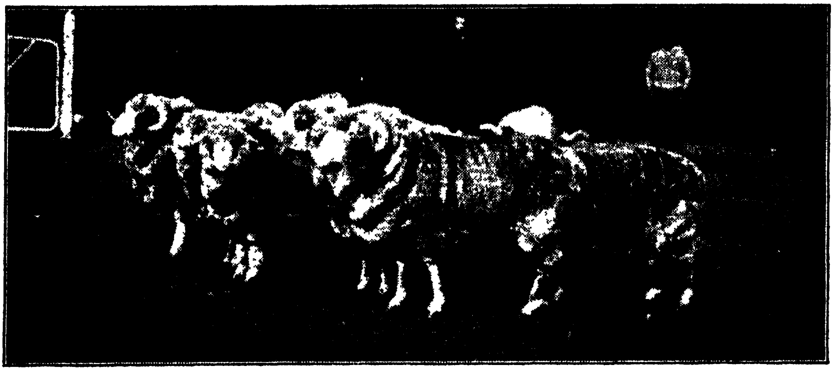


A small section of the Better Rams of a High-class Merino Stud in South Africa. The mixing of Australian strains in many of the Merino flocks of the Union has not tended towards uniformity, although some extremely good animals are produced.

than is the case at present. As a matter of fact, the first Merino sheep landed in Australia were procured in 1789 by Captain Henry Waterhouse at the Cape, from a Mrs. Gordon, and of the 32 animals purchased by this gentleman 29 reached Australia safely and became the foundation of many of the flocks of to-day. The original importations themselves improved under Australian conditions, and their progeny were of considerably higher standard, and the improvement continued and was so great that when sheepfarmers in South Africa began a serious effort to improve their flocks of Merinos, high-class animals were procured in large numbers in Australia for the purpose. The importations from Australia commenced in earnest in about 1885, and until an embargo was placed on the export of stud Merino sheep in 1929, a lot of animals, and particularly rams, were imported regularly, and many of them were really high-priced sheep of good quality. The principal types of Merinos imported from Australia were Tasmanian, Wanganella, and South Australian, and although these introductions were plentiful and had been continued for over 40 years, there are few indications of a distinct South African type of Merino being evolved, or for that matter there are few signs of uniformity, even where the natural conditions of large tracts of country are quite similar. This want of uniformity in the animals, the variability in length of staple, and the unevenness of the wool in various parts of the fleece are variously explained as being due to multiplicity of small studs of low-grade animals, overstocking the pastures, lack of handfeeding in the winter, prevalence of so many diseases, and the use of native labour, but a more likely explanation is that the Merino is a sheep of Mediterranean climate, and South Africa has such a relatively small area of country with Mediterranean climate, or temperate climate in close proximity to a Mediterranean climate area, that a fairly long time will elapse before reasonable uniformity can be attained. Were the embargo on the exportation of Merino sheep from Australia to be lifted an improvement in the flocks of the Union could be anticipated, because much of

A Large-framed Merino Ewe from one of the Prominent Studs of South Africa.

the advancement in type of Merinos of recent years has been brought about by the use of Australian rams, and stud breeders have based their methods and types on Australian standards. This is the impression of sheep breeders in Africa, and all of the stud masters managing high-class stock would like to import rams again as top sires for their studs. Could the better-class studs be improved, and something approaching a type be fixed, it would not take sheep breeders long to improve their flocks appreciably, for there are plenty of specially selected flock rams of quite good quality bred in the country, but these are often of several different types in the one locality, or even in the one flock.



Merino Stud Rams on a Sheep Farm in South Africa.
In most parts of the Union there has been a tendency to breed highly "developed" sheep, carrying fine-quality wool, as can be seen by the animals here depicted.

A Merino Ewe from a Stud Flock Maintained on the Karroo of South Africa.

South Africa undoubtedly has considerable areas of country well suited to the production of fine wools, and the great value of the industry to the nation is now generally recognised, and whether the right of importing rams from Australia is ever returned or not, it seems certain that Merino sheep will be improved in the Union. A really strong team of technically trained sheep and wool experts is attached to the Department of Agriculture, and the officers appear to have the confidence of sheep breeders, and an active drive is being made to push the business forward.

The Department of Agriculture has recently imported a small flock of German Merinos, and placed them at the Stellenbosch-Elsenburg College of Agriculture of the University of Stellenbosch, but it does not appear that this importation will help on the wool industry of the country, but the breed may prove useful in providing dams for the production of fat lambs. These bare-legged, bare-bellied, and clean-faced sheep do not appear to have been developed by selection from pure-bred Merinos, but they are fairly large, are deep-bodied and round-barrelled, so may make a good mother of a fat lamb. They are not nearly so attractive as are Corriedales of fair quality, and it is doubtful if their lambs will be better, or if their fleeces will be as valuable.

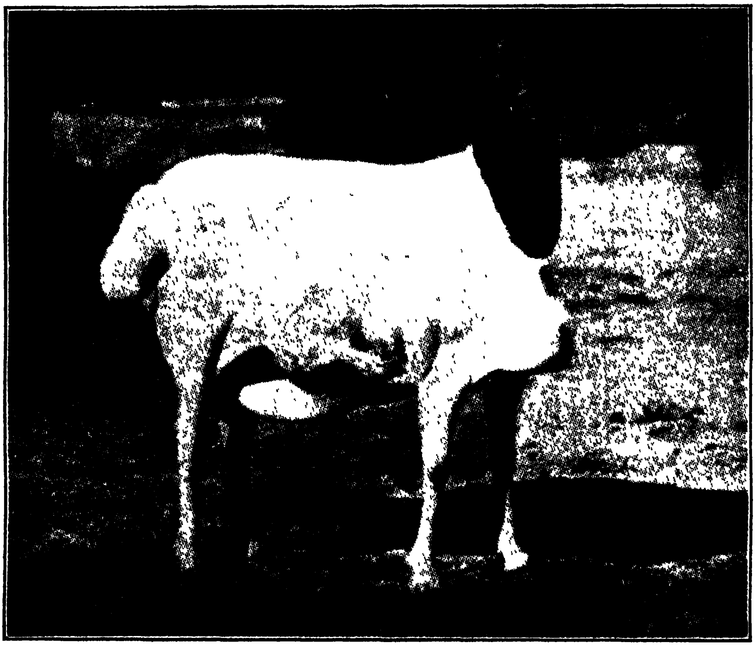
Other Kinds of Sheep.

Because of their hardiness in poor-pasture and drought-liable conditions, and general resistance to diseases and attacks of ticks, several breeds of non-woolled sheep are maintained in considerable numbers for the production of mutton. These sheep are so popular in the country that about 6,000,000 of the total sheep belong to one or other of these breeds. The principal breeds of these non-woolled sheep to be found in the Union are Black-headed Persian, White Afrikander, and Particoloured Afrikander.

Black-headed Persian Ewes with Lambs at foot.

The Black-headed Persian is one of the non-woolled breeds of sheep popular in South Africa, and is really hardy near the tropics where cattle tick are troublesome, and where tropical diseases and pests are prevalent.

The Black-headed Persian sheep are a fat-rumped breed of quite attractive appearance, being of a very white colour in the main, with jet-black head and neck, and when seen in large numbers, particularly on hillsides, present a very pretty sight. Although not very large sheep they are particularly hardy where pastures are scanty, and fatten quickly when they do not have to do much foraging. The flesh of the lambs is much liked in Africa, and lambs in good condition always bring a high price in the livestock markets. A good deal of cross-breeding work with the Black-headed Persian ewes and British breeds of rams is being undertaken with really good results, the first-cross lambs proving very attractive indeed, without the excessive fatness of the rump characteristic of the Persian, but possessing a strong disposition to fatten quickly and to grow to a good size. Lambs out of these ewes by Dorset Horn rams are generally parti-coloured, but are of excellent mutton shape and develop into a really good, shapely lamb of marketable weight very quickly. Others seen by Suffolk and Ryeland rams were mostly black in colour all over, although some by Ryelands were all white, and the lambs by both breeds were quite attractive and useful mutton lambs, and a vast improvement on their mothers. It has yet to be proved that anything more than first crosses can be economically produced in badly infested tick areas, but the results of these cross-breeding experiments have improved the outlook for the production of fat lambs.

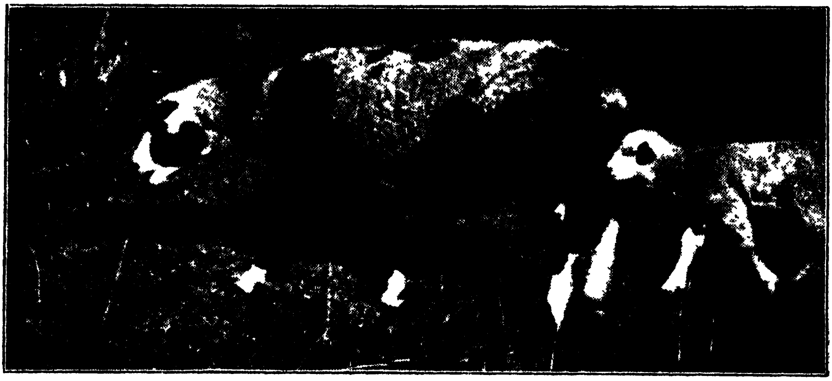


[*From "Farming in South Africa."*]

A Black-headed Persian Ewe Prominent at Agricultural Shows in South Africa.

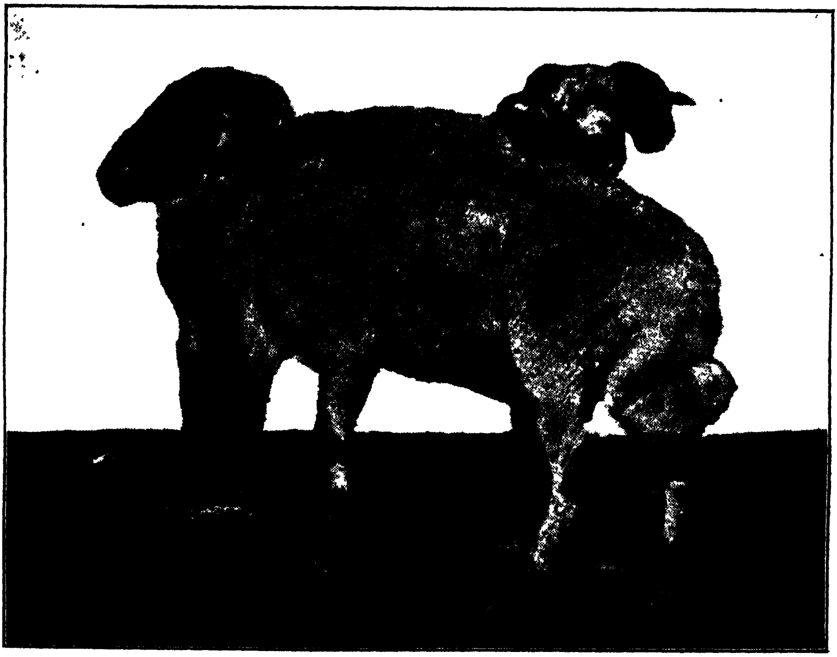
This fat-rumped mutton-breed of sheep is particularly hardy where pastures are scanty, and the animals put on condition rapidly when a fair amount of feed is available. As the illustration shows, they are capable of laying on a lot of fat when treated well.

The original Cape sheep were non-woolled animals with fat tails, and these Afrikanders, both the White and Parti-coloured breeds, persist to-day in fairly considerable numbers. These leggy, hair-producing animals are extremely hardy, and almost thrive when other kinds would perish for a certainty, and when feed is at all plentiful they put on condition very quickly. They are being used in some places to produce lambs by British breeds of rams, and some prominent sheepmen in the Union consider that the White Afrikander is better for this purpose than the Black-headed Persian, which breed is being used fairly freely.



A Crossbred Ewe sired by a Dorset Horn Ram, out of a Black-headed Persian Ewe

Extensive cross breeding experiments,, using British breeds of rams on Black-headed Persian ewes, are being conducted in several places in the Union, and the first-cross lambs are a vast improvement on their mothers.



Parti-coloured Afrikander Sheep.

These leggy, hair-producing fat-tailed sheep are direct descendants of the animals held by the natives when white man first settled in South Africa. Extremely hardy near the tropics, they fatten quickly on good feed and make a fair mother of a fat lamb when mated to a British-bred ram.

There are flocks and studs of most of the British breeds of sheep, and Corriedales as well, to be found in various parts of the country, but the limitations of the natural pasturage are such that, as with cattle, the hardier types are easier to maintain, and until great improvement is made in the pastures the early-maturing mutton breeds of sheep are hardly likely to be multiplied at all quickly.

The keeping of Karakuls for the production of pelts for Astrakhan is being encouraged in suitable parts of South Africa, and quite good quality furs are being secured, and the industry appears to be really promising for this country.

In the livestock salesyards the sheep being offered were almost wholly comprised of Merinos and Black-headed Persians, with a slight addition of mixed and nondescript types. The Merinos easily predominated, and most of the animals being offered at the time were rather poor and of smallish type, but the Black-headed Persian lambs were fat, and although of an unusual shape were quite attractive.

Improving the Wool Clip.

Great efforts are being made to improve the wool of the Union, and a strong staff of wool and sheep experts, most of whom were trained in Australia, is maintained by the Department of Agriculture to help sheepfarmers in every possible way. Besides travelling instructors and inspectors at wool-selling centres, a special course in sheep and wool is conducted regularly at the Grootfontein School of Agriculture and Experiment Station, for which a certificate is awarded, and short courses are given in the handling of sheep and wool at this and other schools of agriculture in various Provinces of the Union.

At the Onderstepoort Veterinary Research Station buildings and equipment have been provided to enable special wool research work to be undertaken, and much fundamental work is now being conducted there.

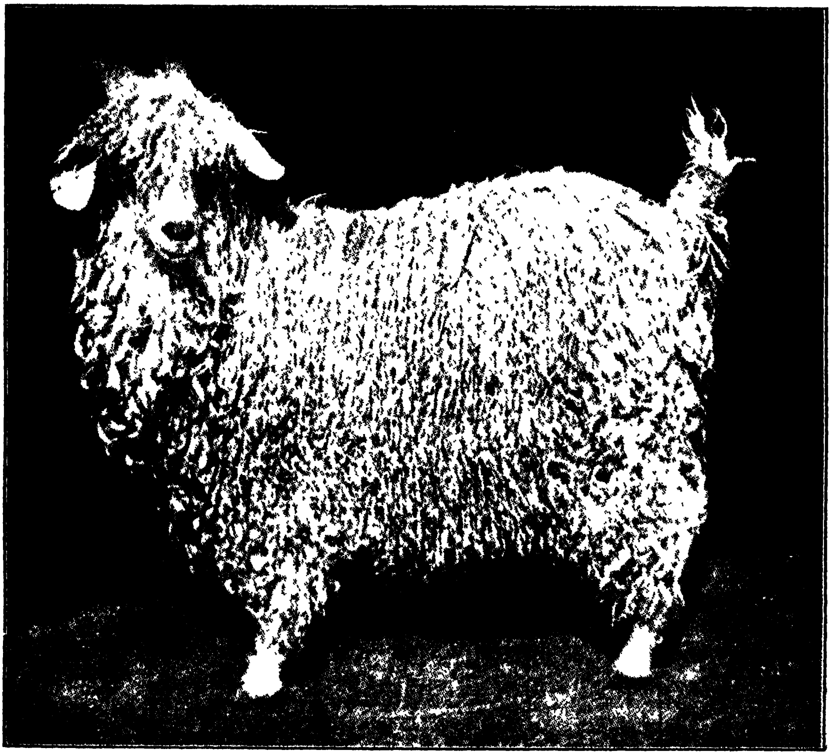
The University of Pretoria has a special branch of its Faculty of Agriculture for investigations into matters connected with wool, and is seriously tackling the question of the effects of various nutritional changes on wool growth. A very effective looking wool-measuring instrument is in use at this institution, in which an individual fibre is tightly stretched, and a much-enlarged image is thrown on to a graduated table where it is easily measured. As the apparatus slides backwards and forwards any particular portion of a fibre can be seen and measured.

Wool Levy and its Uses.

In 1929 a conference of woolgrowers decided to strike a levy of ½d. per bale inspection fee, and on exported wool 11½d. per bale of greasy, and 1s. 5½d. per bale of scoured wool. The inspection fee has been continued but the levies on exported wools have been temporarily suspended, nevertheless the Wool Council was able to spend £8,887 last year, most of which was from withdrawals from investments. The money collected is controlled by a Wool Council which consists of 10 members, two of whom are officers of the Department of Agriculture, six are members of the National Wool Growers' Association and are elected to represent certain Provinces, and two represent unorganised wool growers. The money is used for research work, propaganda, and publicity; the publication of a monthly paper, *The Organized Wool Farmer*, which is distributed gratis; the collection and publication of authentic information on the wool market, and the conducting of wool-classing courses. So successful has been the Wool Council that a Wool Marketing Committee has been formed, consisting of members of the Wool Council and the Wool Selling Brokers' Association, whose functions will be to promote the selling side of the industry.

Selling the Wool.

Much of the wool of South Africa is prepared for marketing in a manner similar to that in vogue in Australia, the better shearing sheds and wool-handling equipment being identical in type to the Australian. Because of the general use of natives as shearers, second cuts are plentiful, and lower the value of fleeces somewhat, and another practice which affects the classes into which wools are placed by wool classers, is that of shearing six to eight months' growth of wool instead of allowing a full year between shearings. This practice is common in the Union and in some years is very prevalent indeed, and as a matter of fact it is estimated that only 20 per cent. of the clips of 1934-35 will be of 12 months' growth, and this largely because of the severe drought the country has just passed through. Of recent times about 50 per cent. of the wool in normal years is of 12 months' growth.



[*From "The Coat of the Angora Goat."*]

A Young Angora Billy of Really Good Type.

The export of mohair is an important industry in South Africa. At one time (1911) there were over four and one-quarter millions of Angora goats in the Union, but droughts and the increased popularity of wool, have led to a considerable reduction in numbers.

Most of the wool appears to be sold by wool brokers at one or other of the ports of Durban, East London, Port Elizabeth, or Capetown, and either by negotiation or by public auction, after it has been exposed in the wool stores. All wool for sale is placed on the wool floor, and not a maximum number of bales of each line as is the case in Australia. A gash is made with a knife in the side of each bale, no attempt being made to cut stitches or save the bale in any way. Auction sales are held three times a week—Monday, Wednesday, and Friday—which means that little wool is sold on any day, and buyers are held in wool-selling towns, to attend sales lasting half an hour to one hour, three times a week.

Goats in South Africa.

When white people settled in South Africa goats were plentiful, and were an important source of meat for their native owners. The ordinary meat and milk-producing goats have been improved to a very considerable extent by better breeding methods, but the introduction of Angora goats had a marked effect on the goat population of the Union, and the export of mohair has become an important industry. The first importation of Angora goats was made in 1838, and between that date and 1897 several other lots were brought into the country. The increase of the flocks was so great that even by 1891 there were about 3,000,000 Angoras in the Union, and this further increased to 4,275,335 in 1911, but the incidence of severe droughts, and the increasing popularity of wool, have led to a great decrease in the numbers of this breed being maintained in the Union.

Goats in the Union.

Year.	Goats.		Mohair.	
	Total.	Angora.	Produced.	Exported.
	No.	No.	Lbs.	Lbs.
1904	9,770,545	3,392,739	—	—
1911	11,762,979	4,275,335	—	—
1921	7,836,696	2,284,571	8,448,550	—
1926	7,987,511	1,831,328	7,879,633	11,141,000
1931	8,249,000	1,649,000	*7,019,082	5,500,000
1932	8,257,000	1,511,000	—	6,435,000
1933	7,802,000	1,339,000	—	15,743,000

Cattle in South Africa.

Even before the first white colonists landed in South Africa cattle were relatively plentiful and of the utmost importance to the natives then in occupation of the country, and the Europeans found them to be of very great value as a source of food. It was not long before the early settlers realised also that the cattle were almost ideally suited for draught purposes in the peculiar conditions obtaining, and that picked animals were able to withstand the hardships of the long journeys, prevalence of diseases and pests, and varying pasturages. This dependence upon large, strong, hardy, fast-walking bullocks which would produce a lot of meat when fattened after working days are over, seems to have had most to do with the development by selection of the present-day Afrikander breed of cattle. The Afrikander cattle appear to have been derived directly from the indigenous cattle of the country, without admixture of any other breed, and at present constitute the only important pure-bred beef cattle in most parts of the Union. The relative importance of Afrikander cattle will naturally become less and less as dependence upon them for draught purposes is reduced by replacements with mules, horses, and tractors and other motor transport. The prevention and control of the diseases which this breed has been able to withstand fairly well, has opened the way for maintaining the better-quality beef breeds of cattle of British origin, and pasture improvement work, which is overcoming the limitations of the natural pasturage, is admitting of the proper development of these beef breeds where beforehand the Afrikander was the best of those able to keep in health and grow to normal size. The Afrikander is an excellent yoke ox and a fair beef-producing breed, and as the crossbreds secured by mating them with British beef breeds are attractive and good doers, the breed will always be important in South Africa, even if the country eventually becomes a prominent producer of beef.

Portion of a Typical Herd of Afrikander Cattle Running on Natural Conditions, without top-dressing, licks, or irrigation.
The Afrikanders withstand cattle tick and tropical diseases much better than do European cattle, and will maintain fair condition where the more delicate breeds would starve, or suffer severely

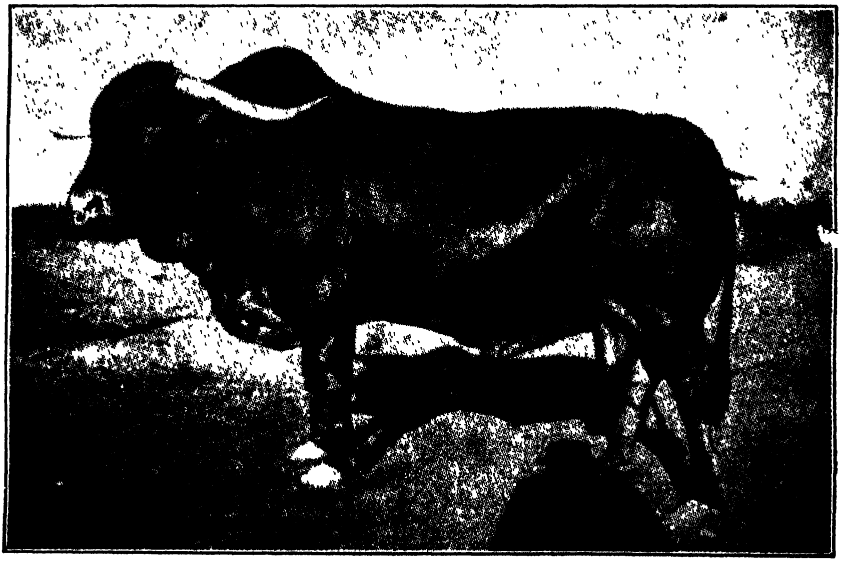
Wonderful veterinary work has been performed in South Africa in the prevention and control of diseases and pests of livestock, and very largely because of the outstanding success attained, the numbers of cattle maintained in the country have been increased to a very considerable extent, and have been kept at above 10,000,000 head since 1925.

Cattle in the Union Since 1904:

Year.	Cattle in Union.	Slaughterings in Abattoirs.*	
		Cattle.	Calves.
	Head.	Head.	Head.
1904	3,500,453	—	—
1911	5,796,949	—	—
1918	6,851,924	—	—
1919	7,532,956	—	—
1920	7,932,270	—	—
1921	8,557,089	—	—
1922	9,200,669	—	—
1923	9,607,336	381,285	24,163
1924	9,898,428	445,350	28,294
1925	10,030,491	494,857	30,573
1926	10,514,281	538,795	32,718
1927	10,589,573	569,904	36,869
1928	10,650,393	577,027	41,719
1929	10,695,091	590,304	41,634
1930	10,750,976	581,955	42,353

* Cattle slaughtered on farms not allowed for.

Pure-bred Afrikander Cattle with Cow of Good Type in the Foreground.
Selected animals are quite fair beef-producers, fatten readily on natural pastures, and have relatively good hind-quarter development.

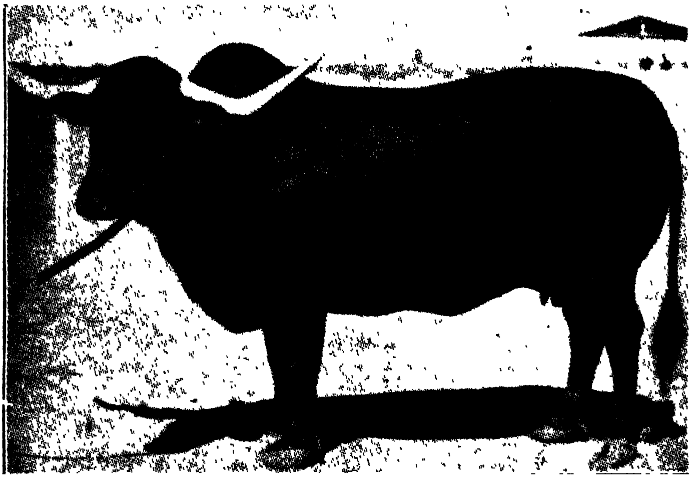


[*From "Farming in South Africa."*]

An Afrikander Bull of Particularly Good Type for Producing Beef.

Quality of Beef Cattle.

There is no way of indicating the improvement which has taken taken place in the quality of the beef cattle, but since so much has been done towards the checking of cattle diseases there has been a constant, although small, stream of importations of really good breeding animals from Great Britain, and the general impression is that, as well as the increased numbers, the quality of the animals is being improved by the grading up of indigenous cattle, and by an increase in the numbers of pure-breds of the better breeds.



[*From "Farming in South Africa."*]

An Outstanding Beef Type of Pure-bred Afrikander Cow.

Dairy Cattle in the Union.

Dairying is important in South Africa to the extent that unless a severe drought is experienced sufficient milk, butter, and cheese are produced to supply local demands, and have a small surplus to export. The dairy cattle being used for the

Friesian Cattle in South Africa.

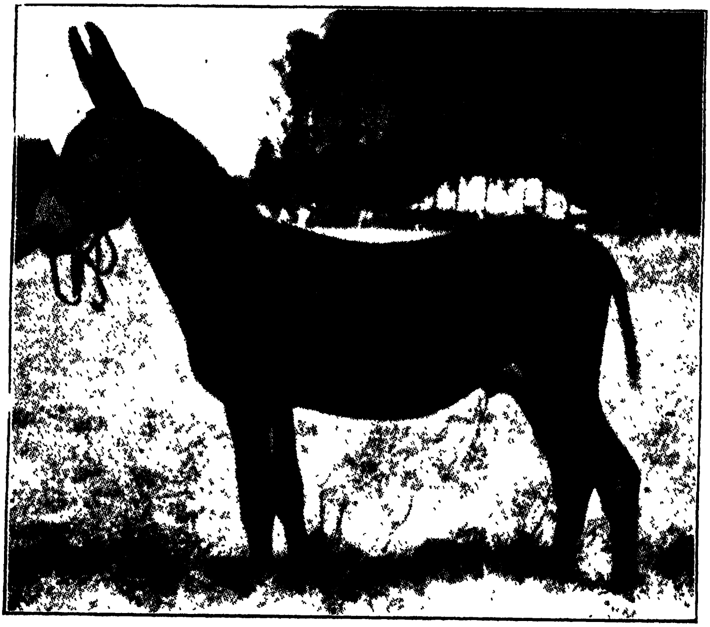
The dairy herds of the Union consist very largely of Friesians, and the country is noted for the quality of the animals of this breed, which are maintained within her borders.

purpose are largely of the Friesian breed, and some very good herds, and plenty of good animals, of this breed are to be found in the Union. In all probability the first European cattle imported into the country were the Friesians introduced from Holland in 1780, and since that date a great number of animals of this breed have been and are being brought in from that country. Of recent years most of the British breeds of dairy cattle have been imported in increasing numbers, and well-bred bulls of most of the prominent breeds now bring good prices.

Other Livestock in South Africa.

Of other forms of farm livestock, pigs are an important source of meat; horses, mules, and asses are maintained in large numbers for draught purposes, and poultry are managed so extensively that an export surplus of eggs is produced.

Pigs.—Between 1904 and 1911 there was an increase of about 50 per cent. in the number of pigs in the country, but since that time relatively little change has taken place, and throughout the period about 1,000,000 pigs a year have been maintained. A little bacon, ham, and lard is exported, but more is imported from neighbouring countries, so the Union is barely self supporting. The existence of a surplus of maize practically every year, and the relatively short journey to Europe, makes it appear that the production of pig products will be increased to a fairly considerable extent in the future. Of the breeds of pigs popular in the country British Blacks still appear as the most prominent, but some Large Whites and Tamworths of good quality are to be seen, and old-type Berkshires and Mid-Yorks are also fairly plentiful.



[*From "The Rehabilitation of Our Horse Stock."*]

A Shapely Catalonian Jack being Used in South Africa.

Asses are so popular as drought animals in the Union, that during the past 30 years, numbers have increased from 140,000 to over three-quarters of a million.

Horses, Mules, and Asses.—The progress of the draught animals (except cattle) has been rather peculiar during the past 30 years, for although the number of mules used has remained at about the same figures as 30 years ago, the horse population has been doubled, and the number of asses has been increased from about 140,000 animals to over three-quarters of a million. To anyone not accustomed to the use of such animals, one of the striking facts of a tour through agricultural districts of South Africa is the enormous number of teams of cattle and asses used in farm work, even on farms belonging to Europeans, that are to be seen almost everywhere, and on the figures recorded it appears that asses are becoming more popular as time goes on.

Poultry.—The keeping of poultry has become increasingly popular, and at the last census, which was taken in 1930, there were present 8,089,968 fowls, 291,192 ducks, 242,472 turkeys, and 154,946 geese. The export of eggs had become so important that in 1930 as many as 193,000 cases of fresh eggs in shell were sent away, but the quantity dropped back to 148,000 cases in 1933.

FIGHTING LOCUST PLAGUES IN SOUTH AFRICA.

South Africa has had long experience in fighting the locusts, as these pests do some damage every year, and occasionally are so plentiful as to cause considerable loss, and lead to heavy expenditure in keeping them in check. Last year, 1933-34, the worst plague on record for the Union was experienced, when beside an ordinary outbreak of the Brown locust, unprecedented numbers of the Red locust invaded the agricultural districts, and cost a lot of money to keep within reasonable bounds. The seriousness of locust plagues to this country is to be seen in the expenditure necessary year after year to fight them:—

Expenditure on Locust Destruction in South Africa.

	£
1920-21	17,000
1921-22	45,855
1922-23	58,221
1923-24	324,726
1924-25	377,214
1925-26	282,000
1926-27	13,730
1927-28	3,753
1928-29	51,237
1929-30	9,315
1930-31	6,672
1931-32	10,903
1932-33	12,677
1933 34 (13 months)	692,673

After very long experience, and despite constant research work in looking for some material fatal to locusts and less dangerous to farm livestock, the Union has found nothing to replace arsenite of soda economically, and the principal line of attack is by spraying this material. A solution of arsenite of soda is sprayed on the herbage and insects to destroy hoppers, and finely powdered arsenite of soda is distributed for fliers. Most of the other well-known methods of control are resorted to when there are peculiar circumstances of some kind connected with the outbreak, such as the erection of low fences to direct the insects to pits, poisoned baits with bran, chaffed greenstuff or somewhat similar material as the carrier of the poison, burning bush, &c., but spraying is general, and is arranged for by the Government. The locust control authorities have established depots throughout South Africa, where spray pumps and arsenite of soda are stored in readiness for tackling a plague, and when an outbreak appears as though it might reach serious dimensions a big organisation is brought into being, and enormous quantities of materials are distributed. During this last period of plague 30,000 Government spray pumps and 5,000 private pumps were used, the equivalent of about 3,000 tons of dry powder arsenite of soda were issued, although some of it was in liquid form, and about 50,000galls. of paraffin were supplied for use with flame throwers for dislodging swarms from plantations and high trees.

In South Africa the Magistrates live in their districts, and amongst Government officers have high status within such districts. For locust-control matters each Magistrate is appointed a Senior Locust Officer, and has full charge of all materials and all control measures within his particular district. He is given power to appoint certain specified officers, and when a campaign is in full swing a very complete national organisation is working throughout the country.

The Organisation for Fighting Locusts.

1. The Minister of Agriculture, through the Secretary for Agriculture.
2. Under Secretary for Agriculture, who is Chief Locust Officer.
3. Senior Locust Officers, in most cases the Magistrates.
4. District Locust Officers.
5. Clerks and Ward Locust Officers.
6. Local Locust Officers.
7. Foremen, Scouts, and Transport Riders.
8. Sprayers.

[*From "Farming in South Africa."*]

Bagging Dead Locusts for Use as Stock Feed in South Africa.
Locusts killed with flame-throwers after they have settled in bushes and trees are collected and stored for stock feed, for which purpose they are very valuable, forming a highly proteinous foodstuff.

Government Aid in Fighting Locusts.

The Act dealing with the control of locusts in South Africa insists upon owners or occupiers of farms being responsible for the destruction of hopper locusts, although if it be found that he is unable to carry out the job after having seriously attempted to do so, the Senior Locust Officer may provide Government assistance. When this is done it is obligatory on the farmer and his employees to continue their efforts towards destruction of the locusts, and the Senior Locust Officer has no right to employ such farmer or any of his employees on locust destruction work while locusts are still on his property. If the farmer refuses to do his duty the Senior Locust Officer shall cause the hoppers to be destroyed at Government expense, but the cost shall be recovered from the responsible person.

Pumps must be returned to depots as soon as finished with so that they may be sent to locations where required.

The Act states that flying locusts shall be destroyed by the Government, and they may be destroyed in any locality and on any farm.

The Senior Locust Officer is responsible for the destruction of locusts on unoccupied Government lands.

If farmers desire that bait be used for the destruction of the locusts on their properties they must supply the bait, and if the necessary bait is not available the destruction work will be proceeded with in the usual manner by spraying or dusting.

Solution for Spraying to Destroy Hoppers.

For some years the solution of arsenite of soda used as a spray contained 0.6 per cent. of arsenite, but recent research work has shown that this strength can be reduced to 0.3 per cent. by the use of suitable "spreaders" without sacrificing effectiveness.

Government supplies consist of coarse powder or liquid, and in each case directions for mixing accompany the parcels.

Dusting for Killing Flying Locusts.

It has been proved that the covering with dust and the surrounding of flying locusts with a cloud of arsenite of soda dust are very effective ways of killing them.

When roosting, the dust is sprayed from a machine known as the Barlow pump, and this type is used and recommended by the Government. If the locusts are roosting in trees they are brought to the ground with flame throwers and then dusted, but if at roost in relatively low bushes they are dusted without shifting them. It takes about 6lbs. to 7lbs. of finely divided arsenite of soda per acre for thick swarms settled on bushes of medium height, and the powder on the bushes remains effective for at least seven days.

For the dusting of locusts in flight, aeroplanes have been used throughout most of this last plague, and proved very efficient for the purpose. It was found that the locusts make no attempt to avoid a cloud of arsenite of soda dust, and so the powder was discharged close to the front of the swarms, and the majority of the locusts which pass through the cloud soon die. The aeroplanes were experimented with in the dusting of swarms settled on trees and on the ground, and their use promises to be a really efficient manner of distributing dust for this purpose.

Poisoned Bait for Locusts.

For the preparation of poison bait a solution of arsenite of soda of a strength of 0.6 per cent. is used, and 10galls. of the solution are sprayed on to about 100lbs. of bran, chaffed green fodder, fine chaffed hay, broken up horse dung, or dry farmyard manure, and the heap is thoroughly mixed with a shovel and allowed to stand overnight. The bait is broadcasted amongst the hoppers, care being taken to scatter it so lightly that stock are unlikely to pick up sufficient to injure them.

SOIL EROSION IN SOUTH AFRICA.

Soil erosion, caused by the rushing of water after torrential rains, is of very common occurrence in South Africa and is playing havoc with good, arable lands in many parts of the country. The trouble is so widespread and serious that its control is looked upon as of national importance, and the Government is making a determined effort to prevent further encroachment, and wherever possible, to reclaim areas almost rendered valueless. The general explanation of the washing away of the country is the removal of the natural vegetative cover by burning, over-stocking, and over-grazing, or the loss of natural fertility of cropped lands by overcropping. Any or all of these, combined with torrential falls of rain, will lead to the scoring of the soils, and their eventual removal down to the underlying rocks.

Soil Erosion Committees have been formed in every magisterial district in the Union to receive and forward applications for assistance to control erosion, to approve of small schemes where technical advice is not necessary, and to encourage landholders to prevent and combat erosion when first occurring, and to discontinue practices likely to lead to the trouble.

When technical advice is required the Department of Agriculture sends a trained man to supply it, and to plan and survey the necessary work, all of which is done free of charge, or at a nominal fee.

A Typical Case of Soil Erosion in South Africa
Havoc is being wrought in many places in the Union by the washing away of the good soils, and the damage already done in some places is so great that it is past correction.

Depending upon the location the corrective work takes several forms, but consists in the main of dams to hold up the water, embankments to distribute the water in shallow sheets instead of as creeks, the planting of trees, establishment of pastures, &c. Because of the peculiarities of the jobs specially trained men are necessary to give advice and to supervise the constructional work, and landholders are taking advantage of the Government's help to such an extent that sufficient expert men to fulfil requests cannot be found in the Union.

Soil Erosion in South Africa Where the Whole Surface, Except a Couple of "islands," has washed away.
Even if such erosion were to be stopped, it would probably take years before the land mellowed sufficiently for the growing of crops or pastures.

The Government advances money on loan on easy terms for erosion correction work, and gives bonuses to landholders who do work at their own expense.

To men who do approved work at their own expense a bonus of 25 per cent. is given, up to a total expenditure of £250, provided no single dam costs more than £150.

Loans are granted up to £250 for approved anti-soil erosion work for a period not exceeding 30 years, at 3½ per cent. interest, and on completion of the work 25 per cent. of the loan is immediately written off.

If a landholder employs, on anti-soil erosion works, Europeans supplied by the Department of Labour, the Government will pay the wages bill, and debit the landholder with one-eighth of the wages. This eighth is taken as a loan free of interest and repayable in 45 equal yearly instalments, commencing after five years.

Twenty-five per cent. of the purchase price of fencing materials used to protect trees grown as an anti-soil erosion measure is refunded by the Government.

[*From "Farming in South Africa."*]

Aerial View of Anti-Soil Erosion Works as Undertaken in South Africa.

In this case distributing banks, and a dam with proper spillways, have been constructed to spread the water on the surface, instead of allowing it to concentrate as soil-cutting creeks.

Municipalities get the same consideration as private people, except that where European labour is provided the nation pays 75 per cent. of the wages.

Special consideration is given to landholders where teams of unemployed men, equipped by the Government, are used for anti-soil erosion work, if the landholder keeps one or more of the team, together with their families, on the farm for five years.

The extent of the area of the Union being affected by soil erosion must be seen to be realised, but if the interest being taken in the matter at present is continued for some time, and landholders can be constantly reminded of the seriousness of neglecting precautions against the trouble, South Africa is going to save much country which would surely be otherwise washed into the sea.

POISONING TREES AND TROUBLESOME PLANTS.

During research work being conducted by officers of the Division of Plant Industry into methods of eradication of the dangerous plant, Poison Leaf (*Gifblaar*), a new method of cheaply poisoning plants was developed, which appears as though it will prove most useful in killing trees, without the risk to animals which is now the case when arsenical compounds are used. The method of poisoning is to frill around the trunk of the tree, or the stem of smaller plants, as is now done when poisoning eucalypts in Australia, and to place in the open frill a slightly damp mixture consisting of 2 parts calcium chloride, 1 part copper sulphate, and 2 parts soil, instead of pouring in a solution of arsenite of soda as is now commonly practised. This system of killing plants is proving fully successful in South Africa, is cheap, and is so perfectly harmless to stock that the operation can be carried out without removing the animals from the paddocks.

THE SOUTH AFRICAN DEPARTMENT OF AGRICULTURE.

Of recent years the people of South Africa, who appear to be more agriculturally minded than do the people of many other nations, have realised more than ever how difficult it is to educate the farmers, and how very important it is that all persons connected with rural activities should receive proper training if the country is to make agricultural progress. The realisation of this fact has led the Government of the Union to build up a well staffed and efficiently equipped Department of Agriculture, which is seriously attacking most of the important agricultural problems of the country, and is endeavouring to educate all those who will eventually earn their livelihood from the land. When the staff of the Department of Agriculture was being enlarged, it was realised that relatively few South Africans were sufficiently well trained to take responsible positions, and that it was necessary to seek men overseas, and recognising this as a decided weakness immediate steps were taken to remedy it. Dozens of promising young South Africans were sent to other countries to receive technical training—to Australia for sheep and wool; to the United States of America for Fruitgrowing and General Agriculture, and to Europe for Animal Husbandry, Veterinary Science, and Winemaking, and good Schools of Agriculture were made of the existing institutions, and the Faculties of Agriculture of the Stellenbosch and Pretoria Universities were encouraged by liberal money grants to modernise their courses of agricultural science. These measures have produced an efficient organisation capable of training future officers of the Department of Agriculture and Education Department, and of keeping producers abreast of the times.

The parliamentary control of the Department of Agriculture is in the hands of a Minister of Agriculture, and he has a technically trained agriculturist as secretary, who is also the chief officer of the Department, and is known as the Secretary of Agriculture. There is a sub-secretary of Agriculture, and five principal divisions, and a few minor branches of the Department. The annual expenditure of the Department of Agriculture, including the grants to the Universities is over £1,000,000 a year, of which over £400,000 is spent on Veterinary Services and Animal Husbandry, more than £145,000 on Agricultural Educational Institutions, and nearly £100,000 on Plant Industry.

The Division of Veterinary Services and Animal Husbandry undertakes all Government activities connected with Veterinary Science, Cattle, Sheep and Wool, Goats, Pigs, and Dairying, and the headquarters of this branch are located at the famous Onderstepoort Veterinary Research Station on the outskirts of Pretoria. Animal Husbandry is an important part of the agriculture of South Africa, and diseases and pests of stock are so bad, that this division of the Department of Agriculture is the most extensive and most expensive of all branches.

The Division of Plant Industry embraces all departmental work connected with Botany, Pastures, Horticulture, Field Crops, Fresh Fruit, Exports, Pre-cooling and Transportation of Fruit, Plant Pathology and Mycology, Entomology, and Plant Regulatory Services.

The Division of Chemistry undertakes soil surveys, some field experimental plots, control of locust poisons, regulatory and control work.

The Division of Economics and Markets endeavours to keep agriculturists advised of market prices and the general economic conditions appertaining to their special interests.

The Division of Agricultural Education and Extension controls the Schools of Agriculture and district instructors, provides home economics services by lectures and demonstrations, conducts agricultural clubs and juvenile competitions, demonstrates with agricultural films on cinematographs, issues and distributes publications, and has charge of all anti-soil erosion works.

The Department of Agriculture interests itself actively in the successful functioning of co-operative societies, and to help in the matter maintains a Registrar of Co-operative Societies, which branch by propaganda and advice helps in the formation and management of such societies.

Each of the four Provinces of the Union conducts a School of Agriculture which issues a diploma after a successful completion of the full course, and at each place extensive field experimental work is undertaken. At all of the institutions special courses are given, some of them being of sufficient thoroughness to give full training, whilst others are of short duration to give students a working knowledge of a particular phase of agriculture. The principal special courses are for wool-classing and dairying, but there are also special courses for school teachers (including women) who are to be stationed in country districts, and short courses on grain grading, wool classing, cheese making, milk testing, household science, poultry, dairy cattle and pigs, general farming, etc.

Last year a special two-years' course was commenced at the School of Agriculture, and known as the Trainee-Settlers' Course, the object being to train young men between the ages of 18 and 21 to fit them as settlers on Crown lands. These young men do practically all of the work on the various farms in an effort to give them a practical training, and by demonstrations and a few lectures, attendance at which is compulsory, some theoretical instruction is also given. Preference in the allocation of Crown lands is to be given, as far as possible, to those passing this course satisfactorily, as well as any more highly qualified or specially trained.

SETTLING IRRIGATION LANDS.

Until the inauguration last year of the Trainee-settlers' education scheme at the Schools of Agriculture married men were chosen as prospective settlers on irrigation lands and were required to spend a probationary period of two years on a block of about 20 acres in area. From now onwards single young men who have successfully passed through the above-mentioned course are selected for the purpose. The advances made, which do not include the small cheap cottage and shed supplied, include four mules, plough, harness, seed, manures, and 4s. per day, and amount to about £300 during the two years. The local Departmental Supervisor directed all operations and insisted on all children of sufficient age, no matter if of school-going age, helping in rush times, such as when picking tobacco, maize, beans, &c., and that no outside labour be engaged unless absolutely necessary. After proving their capabilities during the probationary period the men are allotted blocks up to 40 acres in extent, and the equipment advanced during the probationary period (except dwelling and shed) is transferred to the permanent blocks. Until a trainee-settler has occupied and worked his permanent block for at least one year he is not allowed to marry, otherwise he cannot participate in further assistance or privileges granted by the Government. During the first year of occupancy of the block the settler is expected to make bricks and erect a dwelling as taught to do during the period of training.

All revenue received during the probationary period is collected by Government, and goes towards paying wages and then equipment.

SUMMARY OF IMPRESSIONS GAINED IN SOUTH AFRICA.

1. Although South Africa is very patchy and contains much stony country, in the aggregate she possesses a considerable area of agricultural land.

2. The agricultural possibilities of the Union appear to be limited by the incidence of the rainfall rather than by the total quantity received, or by the quality of the soil, and torrential falls of rain are constantly reducing the available area by erosion.

3. The climate of South Africa varies between Mediterranean at the southern end and tropical in the north.

4. A large area of South Africa receives less than 5in. of average annual rainfall; about one-third receives less than 10in.; and about one-quarter receives over 25in.

5. Much of the country receives its rain in the summer period, and only about one-sixth receives more than 50 per cent. in the six months of autumn and winter, whilst about five-sevenths gets 70 per cent. or more of its rain in the six months of spring and summer.

6. The principal agricultural products of the Union are wool, fresh fruits, sheep-skins, hides, maize, meat, mohair, and wine.

7. Agriculturally, South Africa is largely a grazing country, nevertheless she maintains her population with home-grown crops, except for a slight deficiency of wheat.

8. Maize is the most important crop of the Union, and is the staple foodstuff of the native and poorer European portions of the community.

9. South Africa has an export surplus of maize, and the grain has a good name in importing countries, presumably because it is relatively dry and is particularly suitable for manufacturing purposes.

10. Wheat-growing in much of the Union where the crop is now raised appears to be an uneconomic proposition.

11. South Africa prepares soft fruits such as grapes, peaches, and plums particularly well for exporting to overseas markets.

12. The arrangements for handling export fruits at Capetown, although congested because of the rapid increase in the quantities being exported, are really good.

13. An up-to-date Cool Storage Research Laboratory has just been erected at Capetown, and accurate research work in connection with the various problems of the cool storage of fresh fruits can now be carried out on a large enough scale to be comparable to commercial practices.

14. Several Horticultural Experiment Stations are maintained in various parts of the Union.

15. Citrus fruits are produced in large quantities and form an important export item, and of recent years great improvement has been made in quality, as well as the quantity exported having been increased.

16. The wine industry is very old in South Africa, but the appearance of Phylloxera set the industry back, and it is only now recovering its former importance.

17. Over 95 per cent. of the growers of wine grapes are members of the South African Winegrowers Co-operative Association, an organisation operating under an Act which gives it very wide powers where exports are concerned.

18. Although the livestock production from pastures forms such a very important part of her agricultural products there are relatively few really good pastures in South Africa. This fact is generally recognised in the Union, and strenuous efforts are being made to overcome existing difficulties.

19. South Africa is very rich in indigenous grasses, but like other sub-tropical countries is rather deficient in hardy, fine-stemmed leguminous forage plants.

20. For centuries the southern end of Africa has been an important producer of domesticated livestock.

21. The sheep industry is easily the most important primary industry of the Union, next to gold.

22. In 1931 there were about 50,000,000 sheep in South Africa, but the severe drought of 1933 reduced numbers very considerably.

23. Merino sheep were known in South Africa before Australia was settled, but the breed has not made so much progress in the Union.

24. From 1885 until the embargo was placed on their export a great number of good Merino sheep were imported into South Africa from Australia.

25. The general impression amongst sheep breeders in South Africa is that the lifting of the embargo on the importation of stud Merino sheep from Australia would help to improve the flocks of the Union.

26. The German Merinos introduced into South Africa do not appear as if they are likely to improve wool production in any way, but they may eventually prove to be suitable dams of fat lambs.

27. An appreciable proportion of the mutton sheep of the Union are of the non-woolled type, with fat tail or fat rump, and resistant to ticks and other tropical troubles.

28. A great effort is being put forth in South Africa to encourage breeders to improve the quality and quantity of wool produced.

29. Goats constitute an important part of the livestock of the country, and while the native population is so large will continue in this position.

30. The limitations of the pastures and the peculiar conditions which obtained during settlement by Europeans led to the development of Afrikander cattle, which are excellent yoke oxen and fair beef cattle.

31. In normal years dairy production reaches the stage of supplying local demands and leaving a small surplus for export.

32. About 1,000,000 head of pigs have been maintained from year to year since 1911.

33. South Africa's long experience in fighting locusts has convinced those in charge of operations that arsenite of soda as a wet spray for hoppers, and a finely divided dust spray for flying locusts, are the best methods of attack.

34. Soil erosion is very serious in South Africa, and the Government is making a determined effort to check its further spread and to reclaim some areas almost rendered useless.

35. The discovery that a paste consisting of 2 parts calcium chloride, 1 part copper sulphate, and 2 parts soil is an effective poison for trees and harmless to stock, is likely to prove very useful.

(To be continued.)

INVESTIGATIONS INTO THE CONDITION KNOWN AS "WATERY WHITE" IN EGGS.

[By C. F. ANDERSON (Government Poultry Expert, Department of Agriculture, Adelaide, South Australia).]

In collaboration with the Council for Scientific and Industrial Research, investigations into the condition known as "watery white" in eggs have been conducted over a period of 12 months.

The term "watery white" is used for the reason that there appears no term better suited. In the trade in South Australia, the condition is known under other headings, such as "fractured air cells," "broken air cells," "air bubbles," "tremulous air cells," and various other names, but, for the purpose of these investigations the term "watery white" has been used.

The maintenance of the highest quality in eggs is of importance throughout Australia, and more particularly is it so in South Australia.

South Australia, as a State, is a very big producer of eggs; climatic conditions are eminently suited to the breeding of poultry and for satisfactory production.

Feeding costs are at the minimum, owing to the production of wheat on most of the farms. Wheat, as regards Australia in general, is the principal factor in the cost of production of eggs.

Eggs for marketing are obtained from two principal sources of supply:—

(*a*) That from commercial egg farms, where eggs are produced as a sole means of livelihood.

(*b*) As a sideline to wheat farming, dairying, fruit growing, and market gardening.

The percentage of each source of production can, with reasonable certainty, be estimated at 40 per cent. for commercial egg farms and 60 per cent. where poultry are kept as a sideline in South Australia.

The production is spread practically throughout the State, but the bulk of production would be within a radius of 150 miles from Adelaide.

The importance of quality, from a South Australian point of view, cannot be over-estimated, for South Australia is a big producing State and a small consuming one.

In the early stages of the development of the poultry industry throughout Australia, there was a good demand in the eastern States for eggs from South Australia, but, with the growth of the industry in each State of the Commonwealth, the eastern States are gradually producing eggs in sufficient quantities for their requirements, with the result that these markets are being closed slowly, and thus making it more difficult for South Australia to dispose profitably of the surplus egg production.

There are probably 10 months of the year when South Australia has a surplus production above the requirements of the local market, and in peak months of production, *i.e.*, August, September, and October, this surplus is probably at least 80 per cent. of the production. These figures emphasise the great importance of quality from a State point of view.

The suburban areas in South Australia, too, are, during certain months, producing more eggs than are required for household purposes. Nearly every suburban residence has sufficient ground to keep enough poultry to supply the requirements of the house. It is a regular practice for dairy produce vans, instead of being sellers of eggs, to return with quantities of eggs purchased from their customers. These supplies find their way back to the egg-packing floors, increasing the quantities of surplus eggs.

As regards the disposal of eggs in South Australia, there are only two avenues:—

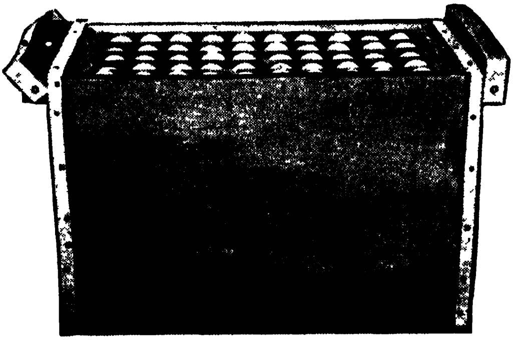
(*a*) The disposal of eggs as eggs in the shell.

(*b*) The disposal of eggs as egg pulp.

When the big surplus available in this State for 10 months of the year is taken into consideration, together with the expansion of the industry in the eastern States, it is apparent that in the absence of some form of marketing control, South Australia will eventually have to depend almost entirely on the overseas markets for the disposal of the eggs and egg pulp.

The export of eggs in the shell is only a seasonal trade, and one that can at present be looked on with any degree of safety for payable prices for the maximum of five months of the year, namely, from July to November. During the remaining portion of the year a large percentage of eggs is pulped.

The egg-pulp trade overseas has not been a profitable one to Australian producers and the present outlook is not favourable, from an Australian point of view, for payable prices. In these conditions, therefore, it is essential that the percentage of export rejects, due principally to "watery white," be reduced to the minimum during the export months, and so obviate the necessity of having large quantities of eggs pulped, the returns for which, under present day conditions, are not payable to the producer.



Standard 25doz. Case, as used in South Australia.

It was for this reason that these investigations were begun.

Prior to these investigations, this Department had collected valuable statistics with regard to rejects due to "watery white" over a period of 12 months, giving special attention to the distance transported and methods of transport. The object in collecting these statistics was to ascertain the effect of transport and locality on the question.

The numbers of eggs pooled and eggs rejected were taken from the account sales of producers, and the grading was strictly on the basis of the regulations governing overseas export under the control of the Commonwealth Department of Commerce.

I might add that the collection necessitated a considerable amount of time, and can be accepted as accurate.

For the purpose of these statistics, the State was divided into seven zones as follows:—

No. 1.—Eggs produced within a 15-mile radius of Adelaide and delivered direct to the packing floor by the producers by road motor transport.

No. 2.—Eggs produced in the Moonta and surrounding districts, a distance of approximately 120 miles from Adelaide. These eggs were transported in a special van that was coupled to a passenger rail motor car and transported direct to the packing floor.

No. 3.—Eggs produced in the Hills districts within 20 miles south of Adelaide and transported direct by the producers by road motor transport.

No. 4.—Eggs produced in the Barossa district within 50 miles north and northeast of Adelaide and transported direct by goods trains.

No. 5.—Eggs produced in country districts and transported direct by motor transport to packing floor, the distance varying from 20 to 50 miles.

No. 6.—Eggs produced in country districts and transported by road to various depots in Adelaide, transhipped, and then carted by road transport to the packing floor, a distance of approximately two miles. The bulk of these eggs would be from districts 50 to 150 miles from Adelaide.

No. 7.—Eggs produced in country districts and transported by goods train to Mile End sheds, transhipped, and carted to packing floor, a distance of approximately two miles. The bulk of these eggs would be from districts 50 to 150 miles from Adelaide.

The appended tables (1 to 7) indicate the results from each zone:—

TABLE 1.—*No. 1 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
July	$67,421^{6}$	311	·46
August	$20,933^{7}$	108^{4}	·51
September	$25,035^{8}$	94^{7}	·37
October	$20,929^{7}$	82	·39
November	$19,368^{4}$	138^{7}	·71
December	$13,679^{9}$	367^{3}	2·68
January	$17,240^{1}$	381^{1}	2·21
February	3,961	124^{4}	3·13
March	$4,169^{5}$	462^{9}	11·09
April	$7,036^{9}$	324^{1}	4·60
May	$2,931^{7}$	8^{9}	·29
June	$9,311^{3}$	43	·46
	$212,018^{6}$	$2,445^{9}$=1·15%	

TABLE 2.—*No. 2 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
July	$6,971^{2}$	43	·62
August	$1,998^{9}$	9^{9}	·48
September	$4,495^{10}$	52^{5}	1·16
October	$2,884^{1}$	54^{4}	1·88
November	$2,714^{8}$	41	1·51
December	$1,625^{10}$	28^{3}	1·73
January	$1,809^{1}$	11^{6}	·63
February	948^{8}	19^{4}	2·03
March	637^{2}	34^{1}	5·34
April	580^{4}	47^{6}	8·18
May	277^{7}	39	1·35
June	703^{4}	4^{1}	·58
	$25,646^{6}$	349^{1}=1·36%	

TABLE 3.—*No. 3 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
July	15,596	243^{5}	1·56
August	$9,648^{11}$	47^{7}	·49
September	$7,724^{4}$	31^{4}	·40
October	$3,200^{2}$	19^{10}	·61
November	$7,057^{7}$	71^{9}	1·01
December	2,172	47^{2}	2·17
January	$4,789^{1}$	50^{11}	1·06
February	$1,088^{9}$	113^{6}	10·42
March	376^{2}	95^{1}	25·27
April	$2,348^{3}$	89^{10}	3·82
May	486^{3}	1^{3}	·25
June	$1,647^{3}$	29^{8}	1·80
	$56,170^{9}$	841^{4} = 1·49%	

TABLE 4.—*No. 4 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
July	$7,065^{4}$	127^{4}	1·80
August	$2,322^{5}$	18^{8}	·80
September	1,587	5^{5}	·34
October	$1,933^{8}$	23^{3}	1·20
November	$5,192^{9}$	157^{2}	3·02
December	813^{9}	57^{10}	7·10
January	$3,211^{4}$	227^{1}	7·07
February	—	—	—
March	464^{7}	95^{11}	20·64
April	413^{5}	25^{11}	6·26
May	469^{10}	5^{4}	1·13
June	57^{3}	—	—
	$23,531^{4}$	743^{11}=3·16%	

TABLE 5.—*No. 5 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
July	$7,675^{3}$	212^{3}	2·76
August	$5,090^{1}$	59^{8}	1·17
September	$3,047^{2}$	44^{2}	1·44
October	$2,466^{6}$	37^{3}	1·74
November	$3,941^{6}$	132^{2}	3·35
December	$1,542^{3}$	25^{2}	1·63
January	$1,393^{1}$	72	5·16
February	$1,374^{5}$	176^{8}	12·85
March	761^{1}	137	18·00
April	1,249	91^{9}	7·34
May	301^{5}	12^{4}	4·09
June	605^{2}	17^{2}	2·83
	$29,446^{11}$	$1,017^{7}$=3·44%	

Table 6.—*No. 6 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
July	5,951^{4}	270^{3}	4·54
August	1,119^{8}	82^{2}	7·33
September	916^{6}	25^{9}	2·80
October	1,297^{9}	0	0
November	1,713^{2}	187^{5}	10·93
December	1,398^{5}	101^{4}	7·24
January	1,807	213^{4}	11·80
February	—	—	—
March	430^{3}	69^{9}	16·21
April	861	88	10·22
May	335^{7}	24^{8}	7·35
June	928^{4}	56^{6}	6·08
	16,759	1,119^{2}=6·67%	

Table 7.—*No. 7 Zone.*

Month.	Eggs Pooled.	Eggs Rejected.	Rejected Rejected.
	Doz.	Doz.	%
July	20,608^{8}	874^{11}	4·24
August	10,725^{1}	571^{7}	5·32
September	6,313	489^{10}	7·75
October	10,431^{1}	559^{8}	5·36
November	7,459^{5}	539^{8}	7·23
December	5,124^{8}	418^{3}	8·16
January	5,515^{2}	596^{6}	10·81
February	1,680^{10}	178^{11}	10·64
March	1,917^{1}	662^{3}	34·50
April	2,470^{2}	416^{5}	16·85
May	971^{2}	21^{7}	2·22
June	2,267^{9}	71^{7}	3·15
	75,483^{8}	5,401^{2}=7·15%	

Summarised, the position for each zone as regards rejects, was as shown in Table No. 8:—

Table 8.—*Summary of Tables* 1 to 7.

Zone.	Total Eggs Pooled.	Total Eggs Rejected.	Percentage Rejected.
	Doz.	Doz.	%
1	212,018^{6}	2,445^{9}	1·15
2	25,646^{6}	349^{1}	1·36
3	56,170^{9}	841^{4}	1·49
4	23,531^{4}	743^{11}	3·16
5	29,446^{11}	1,017^{7}	3·44
6	16,759	1,119^{2}	6·67
7	75,483^{8}	5,401^{2}	7·15
	439,056^{8}	11,918=2·71%	

Table 8 shows that 439,056^{8} dozen eggs were pooled. This quantity gave a fair basis for reliable information.

The effect of transport and distance on "watery white" is well shown by discussing the information given in the tables. In Zone 1, for instance, where the eggs were produced within a 15-mile radius of Adelaide and transported direct by the producer to the packing floor per medium of motor, the rejects were only 1.15 per cent. on a pooling of 212,018^{6}; it cannot be expected that these figures might be improved upon.

From Zone 7, however, where eggs were received from country producers—districts varying from 50 to 150 miles from Adelaide, and where the eggs were transported by goods train to Mile End, transhipped, and carted to the packing floor, a distance of approximately 2 miles—the average percentage of rejects on the total eggs pooled was 7.15 per cent.

Again, in Zone 6, where eggs were received in Adelaide by road from various country districts, transhipped, and carted to the packing floor, the average percentage of rejections on the total eggs pooled was 6.67 per cent. The monthly percentage of rejects in all zones showed considerable variation. The month of March, with the exception of Zone 2, showed the highest percentage of rejects, the figures being as follows:—

	Per Cent.
Zone 1	11.09
Zone 2	5.34*
Zone 3	25.27
Zone 4	20.64
Zone 5	18.00
Zone 6	16.21
Zone 7	34.50

*In Zone 2 the highest percentage was reached in April, the figure being 8.18.

In practically every zone, the percentage of rejects showed a definite increase from the month of January, reaching the highest point in March, then gradually falling off until the minimum was reached during August and September.

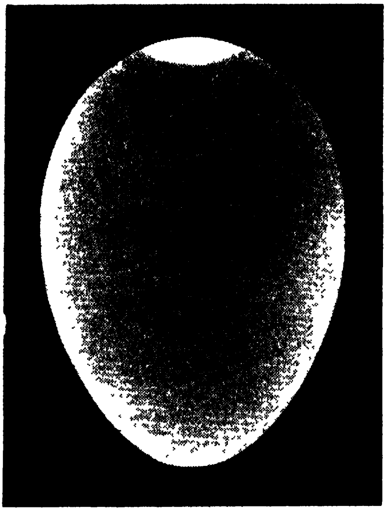
THE EFFECT OF CLIMATIC CONDITIONS ON "WATERY WHITE."

It is interesting to study the appended monthly maximum temperatures at Adelaide taken over a period of five years ended 1934:—

Table 9.—*The Average Monthly Maximum Temperatures at Adelaide over a Period of Five Years ended* 1934.

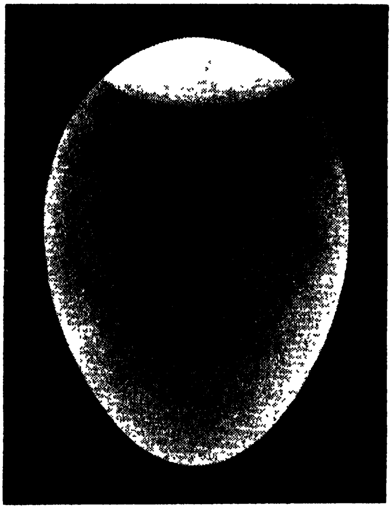
	Degrees.
January	91·8
February	86·9
March	88·3
April	73·5
May	72·6
June	63 3
July	63·0
August	64·6
September	68·8
October	73·8
November	78·3
December	88·0

This table provides serious thought on one of the principal causes of the "watery white" condition in South Australia. That is, with continued high temperatures, so the percentage of "watery white" has shown a definite increase, indicating



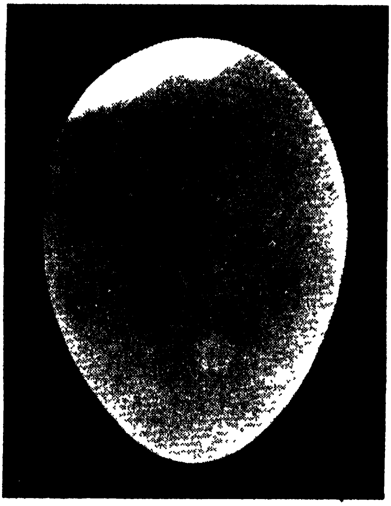
1.

Standard Egg, showing a normal air cell when laid.



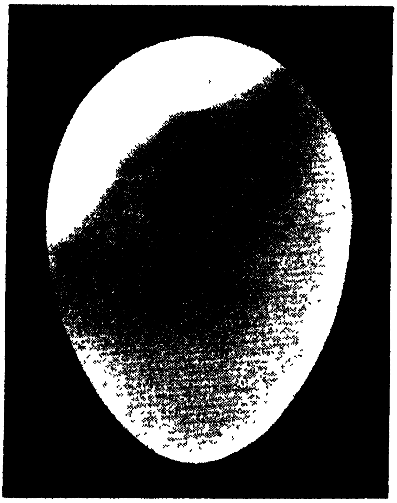
2.

Egg with a large air cell. This is a condition which, under ordinary marketing methods, is common to eggs over a week old.



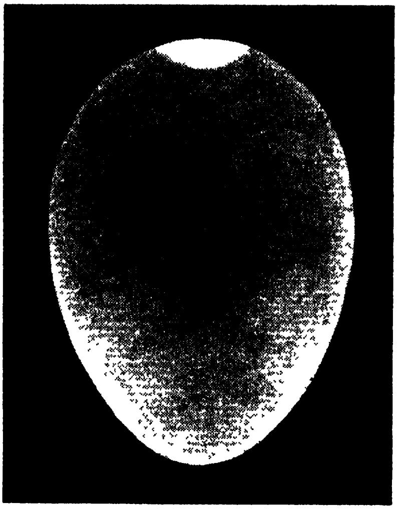
3.

Condition of air cell, due to "watery white," when tested at farm.



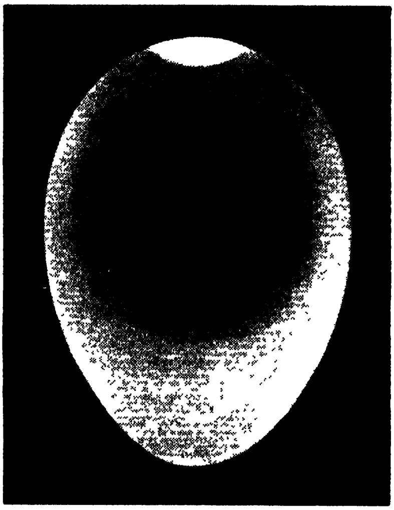
3.

Same Egg as No. 3 when tested at packing floor in Adelaide.



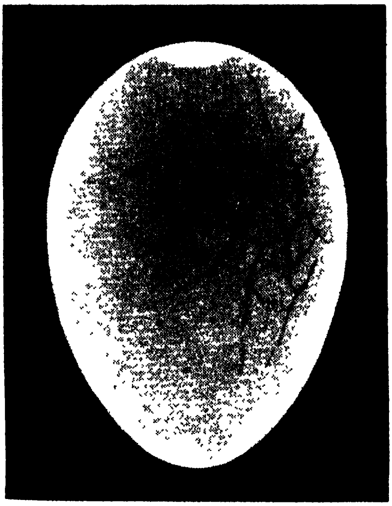
4.

Egg showing Blood Spot, which is due to various causes, principally over-stimulation in feeding.



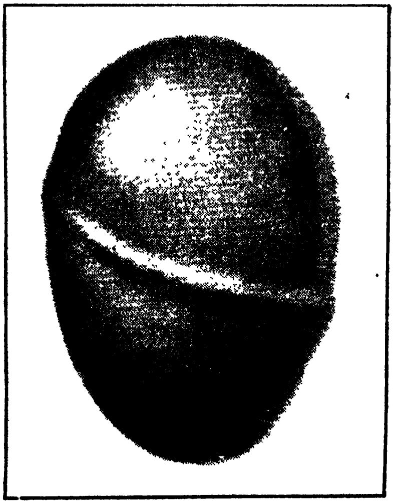
5.

Egg showing cloudy yolk. The cause of this condition is at present under investigation



6.

Egg showing Spider cracks, a condition due to weak shells and rough handling. Difficult to detect until the egg is candled.



7.

Misshapen Egg, mainly caused by over-feeding.

very plainly the imperative need of closer attention being given to the regular collection of eggs, suitable storage, and transportation to the packing floors immediately after the eggs are laid. It has been the practice, in the majority of cases to market the eggs only twice a week during the summer months, but, with a climate like South Australia, it is evident that more frequent deliveries during the hotter months are necessary.

With road transport, it should be the aim to avoid travelling during the hottest parts of the day, and where long transport is necessary the travelling should be done during the night.

For long rail haulage, as evidenced by the heavy rejects in Zone 7 for the month of March, some form of cooling chamber for the transport of eggs is necessary.

The other factor to be considered, and one probably as important as the question of temperature, is nutrition. As the figures indicate, from January to April the percentage of "watery white" shows a marked increase, then it gradually declines until the minimum is reached in August and September. From this viewpoint, it must be understood that from January until March and April the production shows a rapid decline. The stock are finishing their production for the laying season. They have been in more or less heavy lay for 10 or 12 months, and the strain on the physical system of the bird has been severe. It would be of interest if some form of experimental feeding were conducted from November onwards, to ascertain if the condition of the stock could be built up to the standard that the production of first-grade eggs could be maintained at a high level.

The low percentage of "watery white" during the months of August and September indicates fairly clearly that the birds, after the moulting period, come back to production in a strong physical condition, capable of producing a high percentage of first-grade eggs.

In studying the percentage of rejects due to "watery white" throughout the 12 months the average rejects do not appear to be alarming, varying from 1.15 per cent. to a maximum of 7.15 per cent.

The writer's general experience in this direction is that, for some unapparent reason, producers occasionally get fairly heavy rejects in some particular consignments which cause them to complain, but if they took the average over the full 12 months it would be found, in most cases, that the average percentage was relatively low. I have proved this on many occasions after going fully into poolings, covering a period of months, with the producers, and it is, therefore, an aspect that should not be lost sight of. This difficulty, I am afraid is going to be more or less permanent, largely on account of the human element. On the majority of packing floors there are many testers engaged, and in most instances it is a seasonal occupation. It is almost impossible to get two testers to test alike. A producer's consignment may be tested on one day by a particular grader who will pass a big percentage of the eggs, while the next consignment, produced and marketed under identical conditions, may be tested by another grader who will reject a big percentage of them. This is one of the principal difficulties confronting the egg trade. No form of mechanical testing for quality appears feasible at this juncture.

Referring back to the present investigation carried out over a period of 12 months, the principal objects of these experiments were to ascertain the:—

(a) Number of "watery white" found on testing the eggs on the farm.

(b) The number of "watery white" that developed during transport from the farm to the packing floor.

The difficulty of getting various testers to test the eggs on the same basis was realised. Some testers would pass eggs that others would reject. To safeguard against this I deputed the work of testing to Mr. M. W. Aird, the Assistant Poultry Expert. Mr. Aird tested all the eggs under review at the farms and again at the packing floor. Monthly testing was carried out. So as to make the tests as comprehensive as possible, three farms in different parts of the State were selected and, for convenience, the farms will be referred to as A, B, and C.

FARM "A."—Situated at Woodside approximately 25 miles south-east of Adelaide in good clover country with an average annual rainfall of 32.31in. This farm carried an average stock of 1,200 White Leghorns.

Method of Housing.—Semi-intensive, with clover runs. The birds were housed in units of 70 and were kept confined in the houses until 1 p.m., when they were allowed to range. The stock were all reared on free range after they were two weeks old. The feeding was dry mash of the simplest form. The mash was mixed in batches of 120lbs. bran, 160lbs. pollard, 6lbs. meat meal. This was available to the birds at all times. Green feed, principally clover, was fed daily, and wheat at night. In addition, the usual hoppers of shell grit and charcoal were provided.

Transport.—The eggs were transported in a buckboard by the breeder for a distance of four miles from the farm to Woodside, where they were transferred to a road carrier and transported on a bitumen road, a distance of approximately 25 miles to the packing floor.

Method of Packing Eggs.—The eggs were all packed in cocky chaff in cases holding 32doz., the eggs being packed on the side. No fillers were used.

FARM "B."—Situated at Balaklava, approximately 60 miles north of Adelaide. Average annual rainfall, 15.46in. This farm carried a stock of 800 birds, principally White Leghorns.

Method of Housing.—Intensive, birds being kept in units of 70-100 birds and the stock reared solely on the intensive system.

The feeding was wet mash in the morning with grain at midday and night.

Transport.—The eggs were transported by the producer in a motor car ½ mile from the farm to railway, where they were railed in an ordinary van per goods train to Mile End; they were then transhipped and carted about two miles to the packing floor.

From March, 1935, a special van for carrying eggs was coupled to a passenger rail car and on arrival at Adelaide shunted direct to the packing floor.

Method of Packing.—The eggs were packed in cases holding 25doz. with fillers, with a pad of woodwool at bottom of the case and on the top filler.

FARM "C."—Situated at Angaston, some 50 miles north-east of Adelaide. Annual average rainfall, 22.42in. This farm carried a flock of 300 Black Orpingtons and Rhode Island Reds.

Method of Housing.—Intensive. The stock were reared on semi-free range in the orchard. The feeding was wet mash in the morning, grain at midday and night.

Transport.—The eggs were transported from the farm by motor lorry to Angaston Railway Station, a distance of approximately two miles, then per louvre van, which was provided with straw mattresses on floor, sides and ends, attached to a goods train and shunted direct to the packing floor.

The eggs were packed in cases each holding 20^{10} dozen with fillers and a light sprinkling of cocky chaff.

With a view to finding out if any difference existed between pullet eggs and standard eggs, the testings were kept separate. Standard eggs were those weighing 1⅞ozs. and over and pullet eggs those weighing 1¾ozs. and under.

TABLE 10.—*Showing number of eggs tested at Farm A, Woodside, number of rejects due to watery white showing at farm, and number of watery white found on testing at packing floor at Adelaide.*

STANDARD EGGS (1⅞OZ. OR OVER).

Date.	Tested at Farm.	Watery White at Farm.	Watery White at Packing Depot, Adelaide.
1934.	Doz.	Doz.	Doz.
August	79^{3}	4^{1}	5^{11}
September	69	5	11
October	116^{7}	0	3^{7}
November	74^{8}	1	1
December	75^{3}	0^{9}	0^{10}
1935.			
January	68^{8}	1	1^{2}
February	66^{2}	1^{1}	3^{5}
March	63^{2}	4^{6}	6
April	18^{8}	5^{2}	5^{2}
May	12^{4}	0^{4}	0^{7}
June	32	0^{5}	0^{5}
July	111^{5}	0	0^{3}
August	81	0	0
	868 Doz.	23^{4} = 2·6 % of eggs tested at Farm	39^{4} = 4·5 % of eggs tested at Farm

Showing an increase of 1·9 per cent. during transport.

TABLE 11.—PULLET EGGS (1¾OZ. AND UNDER).

Date.	Tested at Farm.	Watery White at Farm.	Watery White at Packing Depot, at Adelaide.
1934.	Doz.	Doz.	Doz.
August	15^{2}	0^{2}	0^{2}
September	18	0	0
October	18^{11}	2^{3}	2^{3}
November	16^{8}	0	0
December	13^{4}	0	0
1935.			
January	12^{6}	0	0
February	9^{6}	0	0
March	13^{6}	0	0
April	2^{10}	0	0
May	10^{8}	0	0
	131^{1}	2^{5} = 1·8% of eggs tested at Farm	2^{5} = 1·8 % of eggs tested at Farm

The pullet eggs did not appear to be affected by transport as much as those of the older stock.

An interesting feature in connection with the testing of the eggs at Farm A was that the texture of the shell was generally weak. This has been the experience of the writer for a number of years where dry mash feeding is practised. It is probably due to two principal causes:—(1) That it is extremely difficult to control the quantity of food the birds eat under this system of feeding. The hoppers are open continuously and the birds eat as much as they like, with the result that they get in an overfat condition, and when this occurs the texture of the shell is generally weak. (2) Again, the birds fed on dry mash drink considerably more water than do birds that are fed on wet mash, and this also probably has an influence on the texture of the shell.

TABLE 12.—*Showing number of eggs tested at Farm B, Balaklava, number of rejects due to water white showing at Farm, and number of watery white found on testing at packing floor at Adelaide.*

STANDARD EGGS (1⅞OZ. OR OVER).

Date.	Tested at Farm.	Watery White at Farm.	Watery White at Packing Depot, Adelaide.
1934.	Doz.	Doz.	Doz.
August	50	1^{8}	2^{1}
September	75	1^{9}	3^{2}
October	86^{6}	1^{6}	2^{2}
November	130	0^{5}	1^{6}
December	125	5	7^{11}
1935.			
January	69	2^{5}	4^{8}
February	58^{4}	0^{6}	15^{11}
	593^{10} Doz.	13^{3} = 2·2% of eggs tested at Farm	37^{5} = 6·3 % of eggs tested at Farm
March	75	3^{11}	4^{11}
April	45^{10}	0^{5}	1^{11}
May	36^{7}	0^{5}	1^{9}
June	37^{6}	0^{2}	1^{1}
July	50	0^{4}	0^{4}
August	66^{8}	0	0
	311^{7} Doz.	5^{3} Doz. = 1·6% of eggs tested at Farm	10 Doz. = 3·2% of eggs tested at Farm

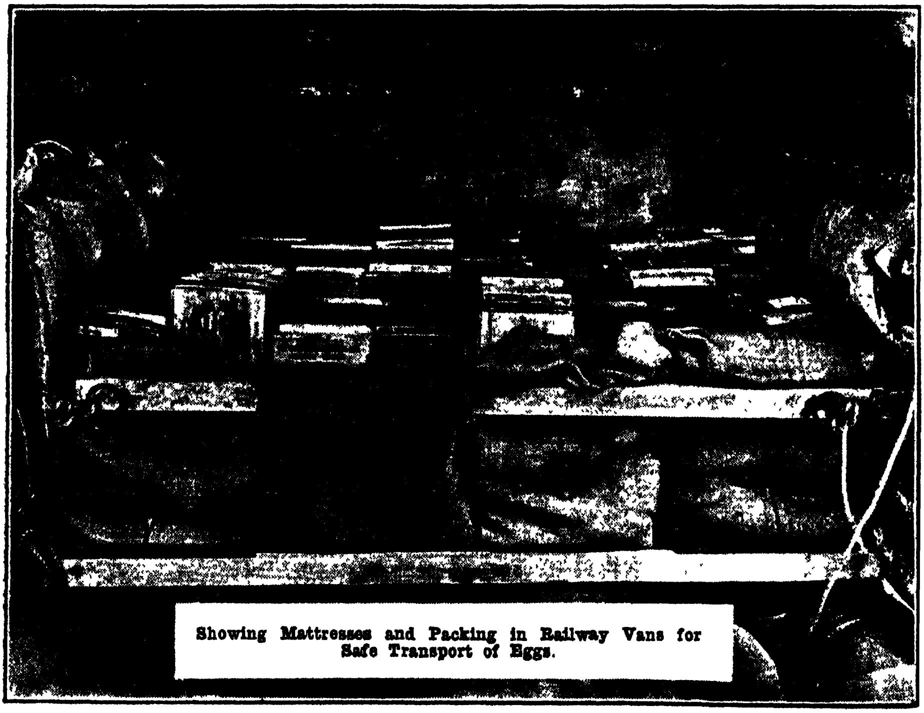
Table 12 is interesting for the principal reason that it clearly shows the effect of improved transport on the question of "watery white."

From August, 1934, to February, 1935, the eggs from Balaklava were transported in a louvre van attached to a goods train, transhipped at Mile End, and carted to the packing floor. The difference in the percentage of "watery white" on the farm and at the packing floor under this method of transport was 4.1 per cent.

From March, 1935, to August, 1935, the completion of the investigations, the eggs were conveyed in a special van provided with straw mattresses on the floor, sides and ends of the truck, attached to a passenger rail car and shunted direct to the packing floor. The difference in the percentage of "watery white" at the farm and at the packing floor was only 1.6 per cent.

Table 13.—Pullet Eggs (1¾oz. and under).

Date.	Tested at Farm.	Watery White at Farm.	Watery White at Packing Floor, at Adelaide.
1934.	Doz.	Doz.	Doz.
August	25	1	3^{11}
September	25	0^{8}	1^{9}
October	23^{6}	0	0^{6}
November	41^{8}	0	0^{2}
December	45	0	0
1935.			
January	25	1^{3}	1^{7}
February	16^{8}	0	5^{10}
	201^{10}	2^{11} = 1·4% of eggs tested at Farm	13^{11} = 6·8% of eggs tested at Farm
March	25	2^{5}	4^{6}
April	4^{2}	0	0^{8}
May	12^{6}	0^{1}	0^{1}
June	12^{6}	0	0
July	0	0	0
August	19^{8}	0	0
	73^{10}	2^{6} = 3·3% of eggs tested at Farm	4^{10} = 6·5% of eggs tested at Farm



Showing Mattresses and Packing in Railway Vans for Safe Transport of Eggs.

The effect of the improved transport on the pullet eggs was reflected as in the instance of the standard eggs. The difference in the percentage of "watery white" between the farm and the packing floor under the old system was 5.4 per cent., while under the improved method of transport the difference was 3.2 per cent.

The eggs generally from this farm were a good sample, size and shape being uniform, and the texture of the shell was good.

Table 14.—*Showing number of eggs tested at Farm C, Angaston, number of rejects due to watery white showing at Farm, and number of watery white found on testing at packing floor at Adelaide.*

Standard Eggs ($1\frac{3}{4}$oz. or over).

Date.	Tested at Farm.	Watery White at Farm.	Watery White at Packing Floor at Adelaide.
1934.	Doz.	Doz.	Doz.
August	33^4	1^1	1^{11}
September	41^8	4^{11}	6^{10}
October	41^8	9	1^4
November	41^8	0^2	0^8
December	40	1^4	6^4
1935.			
January	41^8	1^8	1^8
February	20^{10}	1^4	1^8
March	No testing done	during March	—
April	No testing done	during April	—
May	28	1^2	1^{10}
June	33^4	0^7	5
July	41^8	1^4	1^4
August	66^8	1^3	1^3
	430^6	15^7 = 3·6% of Eggs tested at farm.	29^6 = 6·8% of eggs tested at farm.

Table 15.—Pullet Eggs ($1\frac{3}{4}$oz. and under).

Date.	Tested at Farm.	Watery White at Farm.	Watery White at Packing Floor at Adelaide.
1934.	Doz.	Doz.	Doz.
August	8^4	0^{10}	2^1
September	No pullet eggs	available	—
October	20^{10}	0^3	0^{10}
November	No pullet eggs	available	—
December	No pullet eggs	available	—
1935.			
January	No pullet eggs	available	—
February	No pullet eggs	available	—
March	No pullet eggs	available	—
April	No pullet eggs	available	—
May	No pullet eggs	available	—
June	8^4	0^1	0^{11}
July	20^{10}	0	0
August	16^8	0	0
	75	1^2 = 1·5% of eggs tested at farm.	3^{10} = 5·1% of eggs tested at farm.

All the eggs from Farm C at Angaston were produced by Black Orpingtons and Rhode Island Reds.

SUMMARY OF THE FULL PERIOD OF TESTING.

TABLE 16.—*Summary of Standard Eggs tested at Farms A, B, and C.*

Date.	Tested at Farm.	Watery White at Farm.		Watery White at Packing Depot, Adelaide.	
	Doz.	Doz.	%	Doz.	%
Farm A (Woodside)	868	23^{4}	2·6	39^{4}	4·5
Farm B (Balaklava)	905^{5}	18^{6}	2·04	47^{5}	5·2
Farm C (Angaston)	430^{6}	15^{7}	3·6	29^{6}	6·8
	$2{,}203^{11}$	57^{5} = 2·6% of eggs tested at farm.		116^{3} = 5·2% of eggs tested at farm.	

TABLE 17.—*Summary of Pullet Eggs tested at Farms A, B, and C.*

Date.	Tested at Farm.	Watery White at Farm.		Watery White at Packing Depot, at Adelaide.	
	Doz.	Doz.	%	Doz.	%
Farm A (Woodside)	131^{1}	2^{5}	1·8	2^{5}	1·8
Farm B (Balaklava	275^{8}	5^{5}	1·9	18^{9}	6·8
Farm C (Angaston)	75	1^{2}	1·5	3^{10}	5·1
	481^{9}	9 = 1·8% of eggs tested at farm		25 = 5·2 % of eggs tested at farm	

FURTHER STATISTICS RELATING TO "WATERY WHITE."

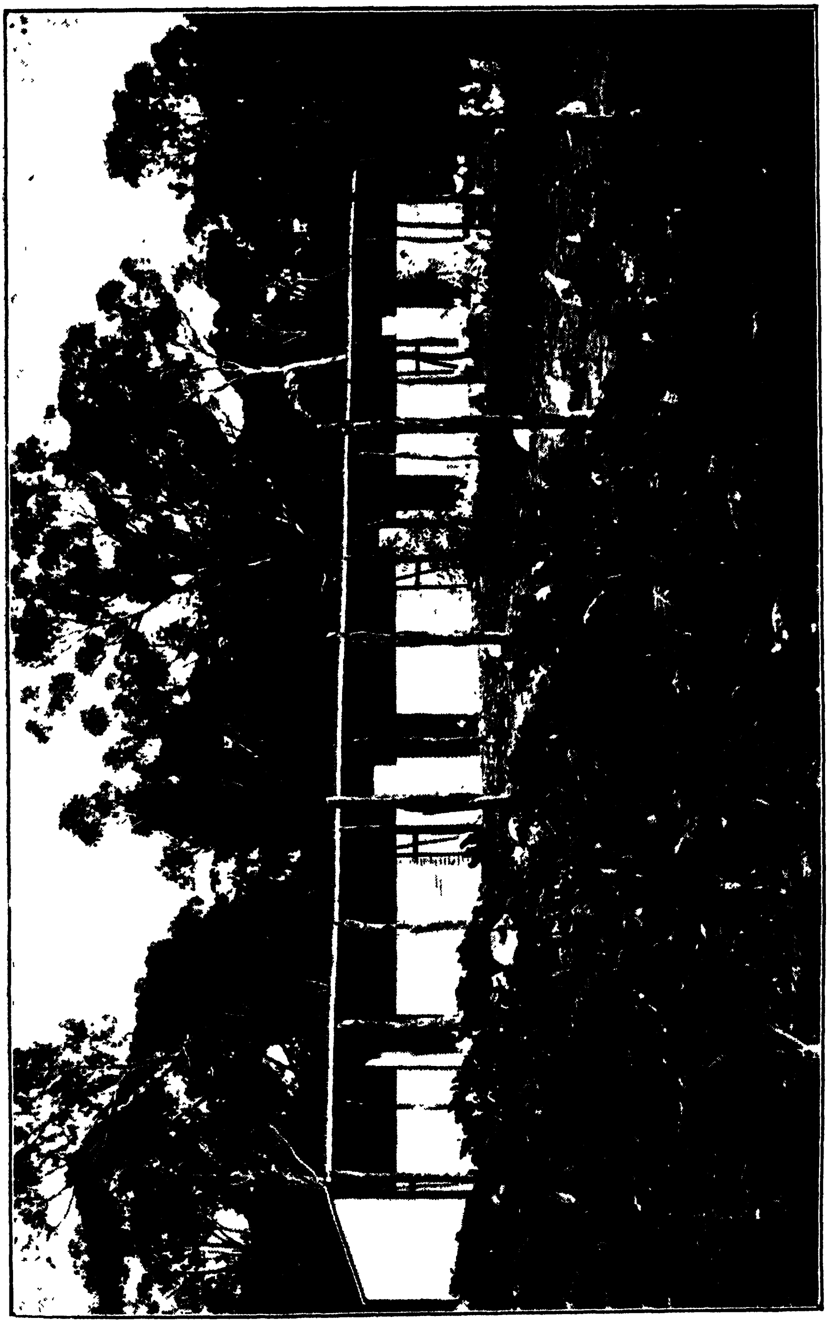
During the last three years there has been established in South Australia a system of land settlement under the direction of the Employment Promotion Council. One of the principal activities of this scheme is the keeping of poultry. The writer is the adviser to the Council on all poultry matters. There have been settled 70 families under the scheme in five settlements as follows:—24 settlers at Meadows; 13 settlers at Echunga; 4 settlers at Bridgewater; 19 settlers at Yundi; 10 settlers at Montarro.

All the settlements are situated in the Hills district south of Adelaide and all are in good rainfall areas, thus assuring, when properly established, a plentiful supply of greenfeed and an almost ideal climate for poultry.

Each settler has been supplied with 400 pullets at from eight to 10 weeks of age and 80ft. of shedding 17ft. wide with yards attached, sufficient to accommodate the number of birds supplied. All the pullets supplied have been White Leghorns. The settlements vary in distance from Adelaide—from 15 miles, in the case of Bridgewater to 38 miles from Yundi.

The method of feeding is:—Morning: wet mash composed of equal parts of bran, pollard, and crushed wheat; chaffed greenfeed; 1lb. meat meal per 100 birds. Midday: wheat. Night: wheat. In addition, hoppers containing shell grit and charcoal are provided.

The eggs are delivered direct from the settlement to the packing floor in Adelaide per motor lorry.



Poultry House designed for the Settlements under the Employment Promotion Council These houses are 80ft. long by 17ft wide, divided into four sections, each 20ft by 17ft Each section accommodates 100 birds

The following table shows the number of dozens of eggs pooled each month, the number rejected for "watery white," and the percentage rejected. The figures include eggs from 1¾ozs. and upwards in weight.

TABLE 18.—*Summary of Eggs Marketed under the Land Settlement Scheme.*

Month.	Eggs Marketed.	Watery White at Packing Floor.	
1934.	Doz.	Doz.	%
November	8,256	323^1	3·9
December	$8,068^5$	314^{10}	3·9
1935.			
January	$7,005^8$	254^{10}	3·6
February	$7,598^9$	111^{11}	1·4
March	$8,795^9$	178^6	2·0
April	$8,370^9$	123^9	1·4
May	$7,568^9$	116^{10}	1·5
June	10,388	94^5	·91
July	$18,345^9$	189^1	1·03
August	$22,393^6$	382^1	1·7
September	$24,390^2$	417^9	1·7
October	28,518	692^3	2·4
	$159,699^6$	$3,199^4$ (2·00%)	

These figures do not cause any particular concern with an average of 2 per cent. rejections over a total pooling of $159,699^6$ dozen. Owing to the situation of these settlements in the Hills districts with comparatively cool temperatures and ample supplies of greenfeed, they are particularly suited to the keeping of poultry.

If reference is made to the statement showing the rejections in the various zones for the month of March—the peak period for rejects due to "watery white"—it will be seen that the percentages varied from a minimum of 5.34 per cent. to a maximum of 34.50 per cent., while the percentage of rejection for the above settlements was only 2 per cent.

A REVIEW OF THE FACTS DISCLOSED IN THE EXPERIMENTS CONDUCTED.

1. In reviewing this series of experiments, there does not appear, from a State point of view, any need for concern; the position, as found in the work conducted by this Department over a period of 10 years, seems to be one of individual farm investigation where any of the many reasons that cause "watery white" may be local.

The figures from the various zones of the State indicate only an average of 2.71 per cent. rejections due to "watery white," varying in quantity from 1.15 per cent. to 7.15 per cent., dependent on the locality of the farm and the method of transport, over a total of $439,068^8$ dozen eggs. With this comparatively small percentage of rejects, and admitting that on individual farms the percentage is abnormally high, the figures do not indicate any cause for undue alarm. In fact, I believe the figures from a State point of view are as low as can reasonably be expected. And on farms where the percentage of rejects is so high, I am of opinion that this percentage can be considerably reduced if attention is given to some of the various causal factors of the trouble.

There might, however, be some advantage to producers if special attention were given to experimental feeding tests, beginning early in November and finishing towards the end of March, to ascertain if the percentages of "watery white" could be reduced during the months of November to March.

2. In the investigational work carried out on the farms, the percentage of "watery white" found at the time of laying was comparatively unimportant as instanced by the following figures:—

	Per Cent.
Farm A—Standard eggs	2.6
Farm A—Pullet eggs	1.8
Farm B—Standard eggs	2.04
Farm B—Pullet eggs	1.9
Farm C—Standard eggs	3.6
Farm C—Pullet eggs	1.5

It will be noted that on Farm C, where only heavy breeds were stocked, the percentage of rejects at the farm was higher than either of the other two farms where White Leghorns were stocked; this was contrary to what was anticipated.

3. On holdings under the land settlement scheme of the Employment Promotion Council and covering a period of 12 months, the average rejection was only 2 per cent. over a total of 159,699^6 dozen eggs. This further strengthens the view, taking the aggregate poolings over 12 months, that there is nothing seriously wrong.

4. The principal factor contributing to "watery white," irrespective of the small percentage of 2.6 of standard eggs found when testing at farm, was the care of the eggs from the time they were laid until they reach the packing floors. Dealing with this question, attention should be given to the following:—

A. Position of the Nests.—The nests should always be placed in the coolest part of the house On practically every poultry plant one may visit eggs can be seen in nests which are exposed to the full strength of the sun, with the result that the contents, especially the white of the egg, is affected at the time of collection. On many poultry farms one can see all types of nests, placed in position more with the idea of ensuring the quick collection of eggs rather than studying the effect on the quality of the egg. It should be unnecessary to emphasise the great importance of the frequent collection of eggs with a view to maintaining the best quality.

When collecting eggs, bumping the container on the ground or gate of the pens should be avoided, as this frequently damages the white and yolk of the egg. Numbers of eggs are damaged in this way.

B. Importance of Shell Grit.—Ample supplies of shell grit and oyster shell grit should always be available, and 5 per cent. of grit should be added to the mash. This provides that those birds that do not eat from the shell grit hoppers get a percentage of grit from the mash. Experimental work has shown that a fair percentage of eggs showing the "watery white" condition are poor-shelled eggs.

C. Removal of Broodies.—All broodies should be removed from the pens as soon as detected. A broody sitting on a nest full of eggs for two or three hours is sufficient to commence deterioration of the eggs.

D. Containers for Eggs when collecting from Nests.—This aspect should be given particular attention, as no doubt numbers of eggs are damaged in this manner.

It has been a fairly general practice in this State to use kerosene or petrol tins for collecting. These containers are not suitable for the best results. They hold the heat too much, especially for the eggs at the bottom of the bucket; when full they hold approximately 200 eggs, so that there is a big weight on the eggs underneath, with the consequent risk of damaging some of them, especially as there is only a comparatively small surface in the bottom of the bucket. Either wicker baskets or wire baskets to hold about a 100 eggs would be more suitable.

E. Provision of Suitable Egg Room.—This is a factor which is neglected on most poultry farms. Expense on other parts of the farm and equipment is not spared, and little or no provision is made for a suitable egg room. Every poultry farm in South Australia should have a room built specially for the storage of eggs. Nothing but eggs should be kept in the room. The room should be cool, well ventilated, and designed so that the temperature is not unduly affected by the outside climatic conditions. With this object in view an underground or partly underground room is recommended.

F. Eggs should not be stored in a draught, as the draught will cause quick drying out of the moisture content.

G. Packing of Eggs.—When packing eggs a layer of woodwool should be placed on the bottom of the case and another on the top of the last layer of eggs before the lid is put on. Examination has shown that a big percentage of rejects occurs in the top layer of the case. This is due to the fact that there is too much movement between the eggs and the lid.

H. Minimum of Handling.—The number of handlings should be reduced to the minimum. Every additional handling increases the possibility of further damage to the egg. Where rail or road transport over long distances is necessary, some form of protection should be given so as to avoid the effect of vibration to the eggs; vibration is the cause of a large number of rejects due to "watery white." Protection can be given by providing straw mattresses or thick rubber mats on the floors, sides, and ends of the lorry or van.

It should not be necessary to emphasise the importance of the frequent delivery of the eggs to the packing floors as soon as possible after they are laid.

I. Study of Returns.—The importance of producers studying their returns for a period of 12 months for the percentage of "watery white" rather than take an individual consignment for a sample where the rejects due to "watery white" appear above the average is emphasised.

J. Condition of Stock.—The condition of the stock also has an important bearing. Birds not in good physical condition, due largely to faulty breeding, housing, and feeding, cannot be expected to produce a large percentage of first-grade eggs. If the various totals published in this article are studied it will be seen that the biggest percentages of "watery white" occur during the months when the stock is finishing production prior to and when moulting, and this factor is one where special attention to feeding is necessary.

SUGGESTIONS FOR FUTURE RESEARCH.

The continuance of this work along the lines already followed would probably be advisable for a further 12 months so that comparative figures could be obtained.

Controlled experimental feeding tests, with the particular object of ascertaining whether the percentage of "watery white" during the months of November to March could be reduced, might be considered.

The individual testing of stock should be practised in order to ascertain if any particular birds are consistently laying eggs with "watery white," so that they could be eliminated from the breedings pens and thus assist in minimising the trouble.

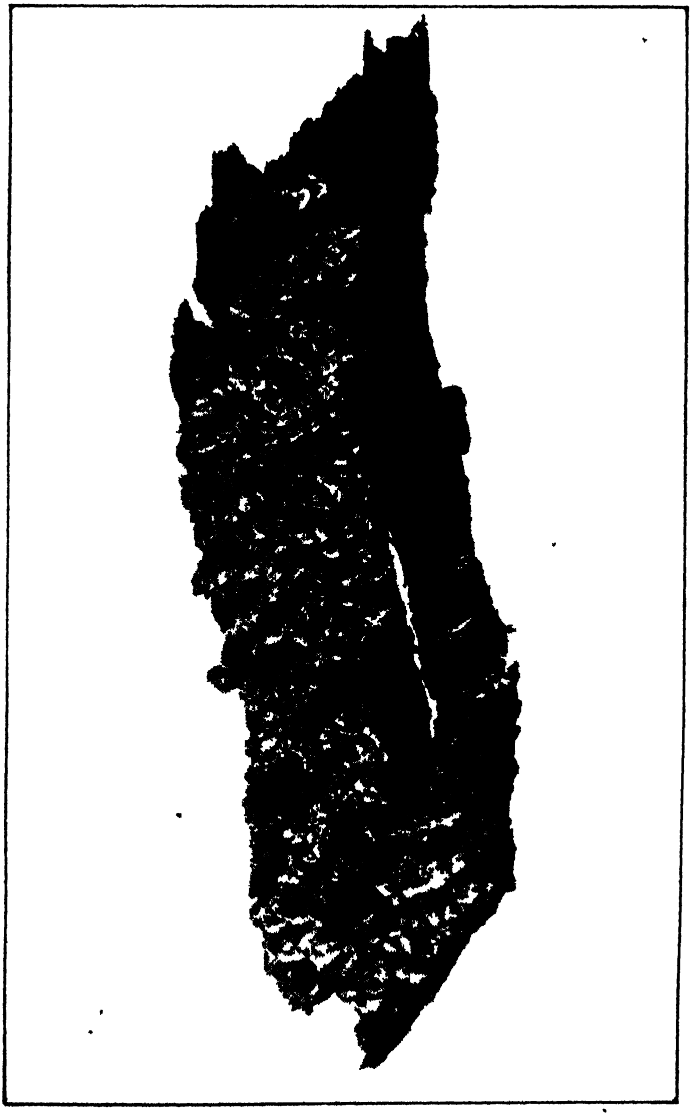
The effects of the various types of houses, nests, and containers in which the eggs are collected on the question of "watery white" must be considered. One of the most important facts that should be immediately considered is the effect of the condition of "watery white" on the storage quality of eggs. In the majority of cases the bulk of "watery white" eggs are new laid. Therefore, some form of testing is necessary to prove that these eggs are a detriment or otherwise as a standard article. In studying this question closely it will be found that a number of workers in other parts of the world have come to the conclusion that eggs slightly affected with "watery white" should not be graded out as of second quality.

In conclusion, I wish to express my appreciation to the owners of the three farms where the work has been conducted, the Dairy Produce Branch of the South Australian Farmers' Co-operative Union, Ltd., Adelaide, for their courtesy in making possible the testing of the eggs at their packing floor, and to my assistant, Mr. M. W. Aird, for the care and thoroughness he has taken in the work of testing.

SILVER LEAF,

[E. Leishman (District Horticultural Instructor).]

The "silvering" of the leaves of plum, apple, and cherry trees has been observed in Hills Districts for a number of years, and although frequent examinations of diseased trees were made, it was not until 1931 that I was able to obtain fructifi-

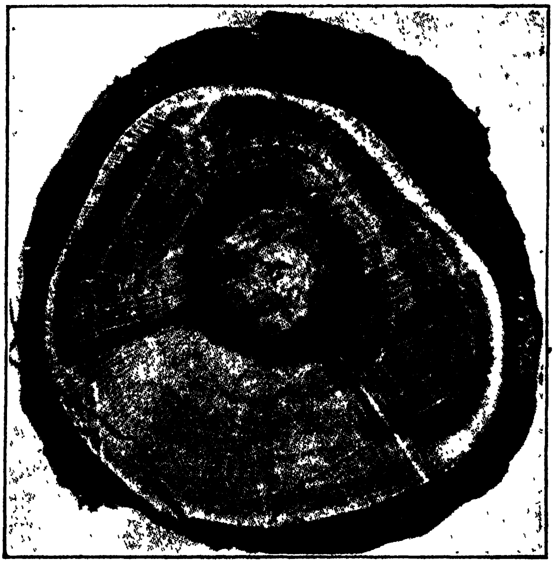


Fruiting Bodies of Fungus (*Stereum purpureum*) found on an Apple Tree at Carey's Gully.

cations of a bracket fungus from trees so affected. This fungus was obtained from portions of apple and plum trees carrying silvered leaves in orchards situated at Carey's Gully, Bridgewater, and Lenswood, and identified by Mr. S. D. Garrett, late Assistant Plant Pathologist of the Waite Agricultural Research Institute, as *Stereum purpureum*. Since this definite identification of *Stereum purpureum* as the cause of silvering, the disease has become widespread on plum and, to a lesser extent, apple and cherry trees, throughout the State.

SYMPTOMS.

Usually, in the beginning, the disease is confined to a single branch or twig, causing the leaves to assume a silvery hue approaching the colour of lead. The branch showing this effect generally dies, and from year to year other branches are affected until the whole tree is involved. Probably three to six years elapse before the tree is wholly killed. The silvering of the leaves is claimed to be due to the secretions of toxins by the fungus in the stem. On the dead limbs and trees the fruiting bodies of this fungus appear. The fructifications appear in two forms, either as flattened incrustations up to several inches in length or forming bracket-shaped projections from about ¼in. to 1in. in width, arranged in tiers one above the other on the dead bark (see illustration). This bracket fungus may be distinguished by the fact that the inner spore bearing surface of hymenium is always quite smooth of a lilac to purple colour. Where leaf silvering due to this fungus occurs, a brownish discolouration of the wood towards the base of the branch is always found.



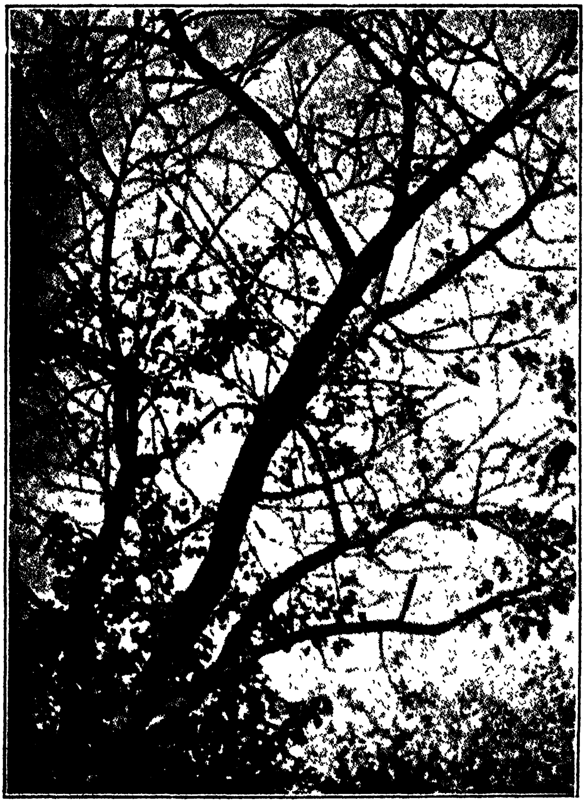
Cross Section of a Branch of a Silvered Transparent Gage Tree, showing diseased and healthy wood.

[*From "Journal of Agricultural Science," Vol. V., Part 3.*]

CONTROL.

Stereum purpureum is a wound parasite, and can cause infection only through wounds due to pruning, bruising the bark of limbs, and breaking off of branches. Trees affected with this fungus do not always die; young and vigorous trees may occlude the fungus by the formation of an impenetrable gum barrier around the invaded tissues.

Resistant varieties are those in which this gum barrier is most readily formed. During the summer months (June, July, and August) in England all varieties of plums exhibit this gum reaction so strongly that no infection can occur. The usual measures of fruit disease control do not apply to "Silver Leaf," therefore precautionary means should be taken.



Upper Part of a Silvered Victoria Plum Tree, one branch of which is dead and bears fructifications of *Stereum purpureum*.

Mr. S. D. Garrett, who had an opportunity to observe work in this connection in England under Dr. F. T. Brooks, recommends the following control:—

1. All wounds should be protected as soon as possible by covering either with soft grafting wax or an antiseptic thick paint, made up as follows:—To 2lbs. of white lead paste (as bought), add two teaspoonsful of paste dryers, and two tablespoonsful of linseed oil. Mix, then add two tablespoonsful of turpentine, and mix well.

2. By the Silver Leaf Order of 1923, English growers are compelled to destroy before midsummer all dead, woody tissues capable of harbouring the fungus, meaning not only dead branches actually on the trees, but all dead wood lying about the orchard.

By cutting out dead branches shortly before mid-summer (July 15th in England) the risk of re-infection through wounds thereby made is reduced to a minimum, for the spores of the fungus are then least abundant. It is exceedingly difficult for the fungus to cause infection at that season.

3. In the early stages when the silvering is confined to a few branches, the disease may be controlled by cutting these out early in the summer. Care must be exercised to cut back well beyond the limit of the discoloured wood otherwise the operation will have been useless. There is, however, a chance that with young and vigorous trees silvered branches may recover. The chances of natural recovery may be materially increased by careful manuring.

The importance of painting wounds with an antiseptic paint after pruning operations has always been advocated as a precautionary measure against fungus diseases. Definite proof that the Silver Leaf disease is in the district should stress the importance of the operations, such as destroying dead limbs, more especially in orchards where Silver Leaf has appeared.

In order to limit the further spread of this serious disease, regulations are in preparation whereby orchardists will be obliged to remove and destroy by burning limbs or trees which have died as a result of the disease.

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.		Average Test.
			Per Herd during October.	Per Cow during October.	Per Herd during October.	Per Cow during October.	
			Lbs.	Lbs.	Lbs.	Lbs.	%
5/C	36	36	30,690	852·50	1,644·93	45·69	5·36
5/D	30·48	29·48	21,161½	694·27	1,137·52	37·32	5·38
5/E	37·26	31·32	24,714½	663·29	1,292·04	34·68	5·23
5/R	70·39	64·94	43,424	616·91	1,965·94	27·93	4·53
5/Z	35	30·35	26,904½	768·70	1,479·71	42·28	5·50
5/Ee	17·35	16	13,128½	756·68	647·14	37·30	4·93
5/Xx	25·90	25·90	15,318½	591·44	721·70	27·86	4·71
5/Yy	11	9·39	5,655½	514·13	289·07	26·28	5·11
5/Aaa	19	18·58	15,041½	791·65	788·96	38·89	4·91
5/Bbb	17·97	17·97	14,189	789·59	705·80	39·28	4·72
5/Eee	25·32	20·26	14,796½	584·37	624·00	24·64	4·22
5/Hhh	16·42	13·77	11,021	671·18	464·26	28·27	4·21
5/Jjj	27	27	17,437½	645·83	1,052·25	38·97	6·03
5/Aa	20·87	20·87	15,140½	725·46	640·84	30·71	4·23
5/Kkk	19·13	17	6,837½	357·42	321·86	16·82	4·71
5/Lll	13·74	11·58	10,612	772·34	483·72	35·20	4·56
5/Rr	21·03	21·03	14,491½	689·08	766·70	36·46	5·29
5/Mmm	32	28·03	24,718	772·43	1,158·58	36·21	4·69
5/Nnn	26	26	20,816½	800·63	1,038·79	39·95	4·99
5/Ooo	23	20·81	19,594½	851·91	836·09	36·35	4·27
5/Ppp	26·03	21·61	18,286	702·48	761·10	29·24	4·16
5/Qqq	31	24·87	16,277	525·06	873·96	28·19	5·37
Means	26·45	24·22	18,193·45	687·86	892·95	37·76	4·91

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during October.	Per Cow during October.	Per Cow July to October.	Per Herd during October.	Per Cow during October.	Per Cow July to October.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	10·23	9·23	6,754½	660·25	2,377·48	360·02	35·19	123·36	5·33
7/P ..	29·45	25·97	22,019	747·61	2,584·07	1,001·06	33·99	121·87	4 53
7/Tt .	15·77	12·42	11,803½	748·41	2,735·14	498·45	31·61	117 74	4 22
7/Bbb	77·87	56·23	47,146	609·30	2,142·47	2,136·90	27·42	95·42	4·39
7/Ddd	12	11·10	9,619½	801·63	3,119·96	465·65	38·80	148 87	4·84
7/Eee	12·68	11·32	8,822¾	695·78	2,545·60	417·58	32·93	125·46	4·73
7/Ggg	15·35	12·77	9,318½	607·06	1,813·32	423·07	27·56	85·81	4·54
7/Hhh	13·13	12·68	13,595½	1,035·40	2,011·09	438·31	33·38	65·72	3·22
7/Iii .	17·90	12·61	15,672	875·51	2,074·84	580·16	32·41	74·68	3·70
7/Kkk	25	22·48	22,679	907·14	2,616·53	1,086·00	43·44	124·61	4·79
7/Mmm	14·06	12·10	9,491½	675·07	2,136·33	496·24	35·29	112·37	5·23
7/Nkn	17·71	16·35	13,944½	787·31	2,829 86	592·14	33 44	123·39	4·25
7/Ooo	23	16·03	12,302½	534·89	1,910·19	493·42	21·45	79·93	4·01
7/Ppp	18·06	18·06	12,899	714·22	2,379·34	615·36	34·07	113·06	4 77
7/Qqq	20·55	18·23	14,332	697·32	2,690·26	657·85	32·01	122·75	4·59
7/Rrr	21 48	17·45	14,067	654 88	2,164·72	625·19	29·11	96·40	4·45
7/Sss	8·45	7·32	6,928	819·88	2,863·72	248·04	29 35	116·23	3·58
7/Ttt	8	6 71	4,925½	615·69	2,539·80	197·54	24·69	104·67	4·01
7/Uuu	22	21·06	13,499¾	613·61	1,688 29	575·38	26 15	71·45	4·26
7/Vvv	21·48	20·55	16,407	763·82	1,958·40	758·68	35·32	88·12	4·62
7/Www	18·94	14·03	12,575	663·58	-	527·65	27 86	-	4·20
7/Xxx	28	21·90	21,228½	758·16	—	826 93	29·53	-	3·89
Means	20 51	17 12	14,560 45	710 09	2,387·14	637·35	31·08	106 52	4 38

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RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during October.	Per Cow during October.	Per Cow December to October.	Per Herd during October.	Per Cow during October.	Per Cow December to October.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	19	19	14,368½	756·25	5,692·71	726·02	38·21	283·77	5·05
6/C ..	23·42	23·13	24,337	1,039·03	6,266·29	1,083·58	46·27	271·95	4·45
6/Y ..	15·94	9·39	10,047½	630·31	3,988·58	380·69	23·88	165·07	3·79
6/FF .	29·45	18	20,979½	712·37	6,327·28	825·54	28·03	262·60	3·93
6/KK	17·90	14·48	10,391	580·50	5,047·48	392·15	21·91	197·81	3·78
6/LL .	25·77	15·97	15,207½	590·39	4,817·84	459·66	17·84	172·99	3·03
6/OO .	25·26	21·32	22,963½	909·08	6,761·38	917·46	36·32	285·62	4·00
6/SS .	20	14·74	17,007	850·35	8,258·25	602·60	30·13	315·45	3·54
6/TT .	28·81	23·32	22,933	796·00	7,062·26	913·27	31·70	295·42	3·98
6/VV .	32	26·61	28,084	877·61	7,743·34	1,207·61	37·74	357 47	4·30
6/XX	26	17·65	15,141	582·34	6,655·81	579·92	22·80	269·01	3·83
6/CCC.	24	12·68	12,035	501·45	4,463·21	487·09	20·30	192·83	4·05
6/DDD	26·65	17·29	18,627	698·91	5,517·07	731·19	27·44	235·34	3·93
6/JJJ	24·74	18·10	17,189	694·72	6,933·61	816·10	32·99	329·60	4·75
6/MMM	8·48	7·48	5,580	658·02	7,402·39	241·94	28·53	335·35	4·34
6/NNN	36·77	28·71	29,344	798·03	6,192·82	1,176·63	32·00	266·13	4·01
6/OOO	30·94	26 55	28,327	915·51	4,682·72	1,156·45	37 38	192 90	4·08
6/PPP	26·97	25·03	24,128	889·58	4,531 99	916·83	33·80	179·31	3·80
6/QQQ	16	14·48	18,504	1,156·50	4,443·70	640·37	40·02	162·63	3·46
Means	24·11	18·63	18,694·39	775·36	6,498·57	750·27	31·12	274·59	4·01

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during October.	Per Cow during October.	Per Cow March to October.	Per Herd during October.	Per Cow during October.	Per Cow March to October.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	30	20·52	15,003	500·10	3,488·62	736·95	24·57	177·62	4·91
9/C ..	16	15·74	13,919	869 91	4,189·68	601·35	37·58	177·93	4·32
9/D ..	30·52	18·90	11,539	378·05	3,365·28	621·15	20·35	185·82	5·38
9/E ..	15	8·84	8,852½	590·16	3,339·71	478·35	31·89	165·64	5·40
9/F ..	18	15·55	12,101½	672·30	3,965·36	510·54	28·36	176·48	4·22
9/G ..	30·65	23·97	26,084½	851·04	3,977·04	1,296·23	42·29	203·33	4·97
9/I ..	29	28·10	22,646	780·99	3,744·59	920·79	31·76	159·23	4·06
9/J ...	11	9	10,512	929·81	4,223·52	452·75	39·74	178·32	4·28
9/L ..	30·35	27·58	14,860½	489·63	3,128·11	599·09	19·74	127·19	4·03
9/O ..	30	26	26,651½	889·95	3,928·76	1,176·02	39·27	181·38	4·42
9/P ..	45	44·65	32,328	718·40	3,766·18	1,529·49	33·99	192·30	4·73
9/T ..	20·03	17	16,579	827·70	3,362·98	768·13	38·35	153·56	4·63
9/W .	28	17·74	16,456½	587·73	4,593·08	669·24	23·90	196·85	4·07
9/X .	10	9·29	5,866½	587·61	3,462·89	285·56	28·61	174·48	4·86
9/Y ..	9·55	8·06	7,015	734·55	3,942·33	292·30	30·61	160·51	4·17
9/Z ..	13·03	10·68	5,648½	433·49	2,631·15	295·10	22·65	132·23	5·23
9/AA .	16·87	16·71	11,700½	693 56	3,821·79	624·60	37·02	210·85	5·34
9/BB .	30·74	26·68	18,971½	617·15	2,914·52	924·45	30·07	146·73	4·87
9/CF .	17	17	10,710½	630·02	4,201·68	630·34	37·08	223·46	5·89
9/EE .	44	40·87	22,796	512·74	2,147·33	1,131·49	25·48	105·90	4·98
9/FF .	4	4	2,170	542·50	1,834·80	79·38	19·85	66·75	3·66
9/DD	17	15·58	8,328½	489·91	1,949·00	370·37	21·79	93·68	4·45
Means	22·53	19·20	1,457·91	646·99	3,523·35	681·53	30·25	168 82	4·67

SEED WHEAT FROM CROP COMPETITIONS.

In Wheat Crop Competitions, conducted in the undermentioned Districts the following Competitors exhibited crops which, in the opinion of the Judge at the time of inspection, should produce grain suitable for seed purposes.

District. Competitor. Address. Variety.

MIDLANDS—

P. McD. Smyth, Salter's Spring—Marathon, Dundee.
C. J. Lake, Owen—Ford.
J. S. Lake, Owen—Ford, Marathon.
C. J. H. Behn, Riverton—Dundee, Baringa, Ghurka, Waratah.
G. Hazel, Kapunda—Ranee 4H.
Hughes Bros., Kapunda—Ranee 4H.
L. V. Bell, Marrabel—Ranee 4H.
J. F. Riechelt, Tarnma—Dundee, Carrabin.
D. H. Campbell, Buchanan—Ranee, Sword.
Gask Bros., Gum Creek—Carrabin, S.H.J.
L. F. Thomas, Hallett—Gallipoli.
R. L. Slugget, Hill River—Dan.
D. & J. Kelly, Giles' Corner—Dundee.
Molineux Bros., Tarlee—Sword.
A. G. Kirk, Farrell's Flat—Mogul, Sword.
L. A. Martin, Farrell's Flat—Dundee.
G. Klem, Farrell's Flat—Dundee, Mogul.
S. Garrard, Mintaro—Gallipoli.
J. Garrard, Farrell's Flat—Ranee, Dan, Gallipoli.
J. H. Torr, Farrell's Flat—Dundee, Mogul.
Miller Bros., Farrell's Flat—Gallipoli, Ranee.
R. F. Kelly, Manoora—Ranee 4H.
H. Schunke, Manoora—Gallipoli.
T. W. Allen, Auburn—Dundee, Ghurka.
J. Ross, Mintaro—Sword, Waratah.
R. Blatchford, Mintaro—Dundee, Ranee 4H.
W. Woods & Sons, Wirrilla—Dundee.
A. J. Jones, Manoora—Gallipoli.
P. C. Schnaitmann, Saddleworth—Waratah, King's White.
F. Coleman, Saddleworth—Dundee, Ranee 4H, Ghurka.

CHANDOS—

E. S. Ross, Parrakie—Sword.
P. Ross, Parrakie—Sword.
A. Y. Knight, Geranium—Sword.
R. A. Haman, Lameroo—Sword.
H. Hunt, Geranium—Sword.
W. H. Cabot, Parrakie—Sword.
H. E. Vogt, Pinnaroo—Sword.
Mattiske Bros., Pinnaroo—Ranee 4H.
A. H. Edwards, Pinnaroo—Sword.
H. F. Johnson, Parilla—Waratah.
J. L. Koch, Lameroo—Waratah.
A. J. A. Koch, Lameroo—Bencubbin.
H. M. Symon, Pinnaroo—Ghurka.
F. S. Traeger, Pinnaroo—Nabawa.

SEED WHEAT.—*Continued.*

District. Competitor. Address. Variety.

SOUTHERN YORKE PENINSULA—
W. H. and J. Alderman, Minlaton—Sword.
N. H. Boundy, Minlaton—Ford.
H. Polkinghorne, Minlaton—Sword.
A. J. Short, Curramulka—Bobin.
O. H. Bittner, Curramulka—Bencubbin.

MID YORKE PENINSULA—
E. F. Heinrich, South Kilkerran—Dan.
O. B. Linke, South Kilkerran—Ford.
S. W. H. Heinrich, South Kilkerran—Geeralying, Sword.
J. C. A. Arnold, South Kilkerran—Sword.

LE HUNTE—
P. P. Cook, Mount Damper—Ford.
J. Christian, Yaninee—Nabawa.
S. C. Billinghurst, Minnipa—Ford, Merridin.
G. Williams, Minnipa—Merridin.
A. Shepherd, Wudinna—Sword.

CENTRAL—
H and M Wehr, Freeling—Nabawa.
L. George, Wasleys—Sword.
W. H Aldridge, Gawler River—Sword
Messrs Dawkins and Aunger, Gawler River—Sword.
H. J. Griffiths, Salisbury—Dundee
G. Heinjus, Sheoak Log—Sword

NORTHERN YORKE PENINSULA—
M. D. Wright, Cunliffe—Sword
Mrs. J. H Bussenchutt, Paskeville—Sword.
G. E. and H. M. Meier, Paskeville—Sword, Waratah, Bencubbin, Dundee.
J. S. Henderson, Arthurton—Sword and Ford.
R. S. Bussenchutt, Paskeville—Dundee.
Yelland Bros., Paskeville—Ranee 4H.

BALAKLAVA—
E. Baker, Barabba—Nabawa.
W. J. Marshman, Owen—Nabawa and Sword.
D. J. Wilson, Barabba—Ford.
Bowyer Bros., Owen—Ford.
Harkness Bros., Owen—Sword.
J. D. Campbell, Barabba—Sword.
A. N. and H. M. Freebairn, Owen—Sword.
Sorrell Bros., Barabba—Sword.

ALFRED—
G. E. Hyde, Paruna—Nabawa, Ranee 4H, Sword.
N. C. Webb, Paruna—Sword, Nabawa.
D. and H. Kretschmer, Paruna—Nabawa.
E. M. Edwards, Paruna—Ranee 4H.
G. J. Zimmermann, Meribah—Caliph, Nabawa.
P. Paull, Alawoona—Ranee 4H.
A. Fisher, Noora—Sword.

SEED WHEAT.—*Continued.*

District. Competitor. Address. Variety.

ALBERT—

E. A. Kroehn, Nildottie—Nabawa.
A. E. Horstmann, Netherleigh—Bencubbin.
J. W. G. Mann, Mindarie—Sword.
H. Bird, Halidon—Sword.
G. H. Sutherland, Copeville—Ranee 4H.
A. G. W. Grant, Sandalwood—Sword.

BUXTON—

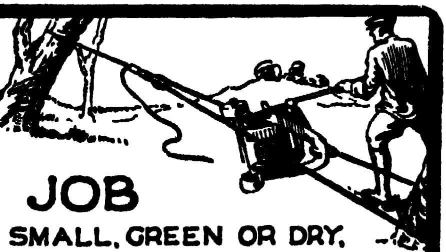
C. G. and G. W. Cant, Kimba—Ranee 4H.
J. E. Beinke, Kimba—Gluyas.

JERVOIS—

W. C. McCallum, Arno Bay—Sword.
M. H. Burton, Rudall—Waratah.
D. C. McCallum, Rudall—Waratah.
F. H. Brine, Miltalie—Waratah.
T. L. Badman, Miltalie—Ranee.
J. C. Sims, Cleve—Waratah.

MIDDLE NORTH—

J. E. Lehmann, Caltowie—Bencubbin and Totadgin.
W. S. Adams, c/o Misses McLeod, Jamestown—Ranee 4H.
W. Keding, Belalie North—Turney.
C. E. Keller, Wirrabara—Ford.
J. Knauerhase, Laura—Ford.
J. W. Prior, Gladstone—Ranee 4H, Sword, Ford.
A. D. Bray, Belalie North—Dundee.
N. W. Royal, Caltowie—Sword.
E. Symonds, Caltowie—Ford.
T. Cockburn, Wirrabara—Ranee.



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ADELAIDE STOCKISTS—Australasian Implement Co., Colton, Palmer & Preston, Harris Scarfe Ltd., McPhersons Pty. Ltd., South Australian Farmers' Union.
TREWHELLA BROS. PTY. LTD., TRENTHAM, VIC.

SEED WHEAT.—*Continued.*

District Competitor Address. Variety.

SOUTHERN—

H. B. Scheer, Mannum—Sword.
A. C. Bormann, Millendilla—Sword.
A. E. Wegener, Millendilla—Sword.
V. W. Eichler, Mannum—Sword.
W. R. Pese, Mannum—Sword.
Wachtel Bros., Palmer—Sword.
H. Wachtel, Palmer—Sword.
L. Wachtel, Palmer—Sword.
C. S. E. Paech, Tepko—Sword.
L. A. Krause, Palmer—Sword.
H. A. Krause, Palmer—Sword.
G. W. Faehrmann, Palmer—Sword.
S. A. Bretog, Mannum—Sword.
B. R. W. Lindner, Mannum—Sword.
Prahn Bros., Monarto—Sword.
Hugo Paech, Rockleigh—Dundee, Bencubbin, Sword.
C. F. Altmann, Monarto South—Ranee.
Thomas Bros., Monarto South—Sword.
J. J. Hartmann, Monarto South—Waratah.
E. E. Libelt, Monarto South—Nabawa.
W. H. Schubert, Brinkley—Sword.
E. W. Pearson & Sons, Brinkley—Sword.
G. Cross, Belvidere—Sword.
Rankine Bros., Strathalbyn—Baringa.
A. B. Jaensch, Hartley—Nabawa.
E. and T. Jaensch, Hartley—Ford, Sword, Bencubbin.
H. H. Cross, Woodchester—Sword, Ford.

FLINDERS—

G. & A. Lawrie, Ungarra.—Ford.
P. H. Wagner, Brimpton Lake.—Ford.
M. Aikenhead, Brimpton Lake.—Nabawa, Sword.

FAR NORTHERN—

W. G. Gregurke, Wepowie—Ranee 4H.
T. F. Orrock, Wepowie—Dundee.
J. G. Crocker, Wepowie—Ranee 4H.
E. W. E. Paech, Box 89, Orroroo—Nabawa.
E. H. Hampel, Terka—Ranee 4H and Sword.

OATS.

C. Rodda, Thrington—Guyra and Mulga.
T. Rodda, Thrington—Early Kherson.
G. E. and H. M. Meier, Paskeville—Palestine, Early Kherson.
C. J. H. Behn, Riverton—Imbros Is., Algerian, Calcutta Cape.
Geo. Hazel, Kapunda—Calcutta Cape.
Hughes Bros., Kapunda—White Essex.
F. Coleman, Saddleworth—Algerian, Calcutta Cape.

BARLEY.

W. K. Oliver, Wasleys—Prior.
T. Rodda, Thrington—Prior.

DEPARTMENT OF AGRICULTURE.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

LEADING SCORES TO WEEK ENDED 17TH *NOVEMBER,* 1935.

FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
E. McKee	165	27
H. C. Stacy	159	36
G. Joyce	154	290
Trios—		
E. McKee	444	28–30
W. H. A. Hodgson	411	298–300
V E. Williams	405	313–315

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR Summer, 1936.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

BLACK ORPINGTONS.

EGGS.—10/- per Setting of 15 Eggs. Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—17/6 per dozen; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

Free on Rail,
Salisbury.

DELIVERY.—CHICKS—January to March.
EGGS—January to February.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

Teams—

J. J. Devlin	766	205–210
C. R. Wharton	765	127–132
W. Sickert	750	169–174

Class No. 2.—Any other Light Breed.

Singles—

A. Heaysman (Cuckoo Leghorn)	152	323
Langmaid and Bettison (Black Minorca)	120	321

Class No. 3.—Black Orpingtons.

Singles—

K. Pennack	143	340
A. G. Dawes	134	327
H. J. Mills	131	335
H. J. Mills	131	331

Trios—

H. J. Mills	359	331–333
A. P. Urlwin	301	465–467
L. S. Ekers	290	358–360

Teams—

H. J. Mills (only 5 birds)	595	331–336
K. Pennack	560	337–342
H. H. Gallagher	530	343–348

Class No. 4.—Any other Heavy Breed.

Singles—

H. J. Mills (Rhode Island Red)	164	364
V. F. Gameau (Rhode Island Red)	129	380
F. F. Welford (Rhode Island Red)	129	374

Trios—

K. Pennack (Barnevelders)	367	388–390
V. F. Gameau (Rhode Island Reds)	316	379–381
K. Pennack (Barnevelders)	279	385–387

Teams—

K. Pennack (Barnevelders)	646	385–390
V. F. Gameau (Rhode Island Reds)	522	379–384
A. G. Dawes (Rhode Island Reds)	510	367–372

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Singles—

G. R. Cowell	130	391
A. J. Monkhouse	122	398
A. J. Monkhouse	121	402

Trios—

A. J. Monkhouse	303	400–402
A. J. Monkhouse	277	397–399

Teams—

A. J. Monkhouse	580	397–402
G. R. Cowell	440	403–408

Class No. 7.—Black Orpingtons.

Singles—

W. R. Christie	102	409

Class No. 8.—Any other Heavy Breed.

W. R. Christie (Rhode Island Red)	108	412

SECTION 3.—WET MASH.

Singles—

Eric Pratt, Abattoirs (White Leghorn)	150	434
Warren Hannaford, Paracombe (White Leghorn)	145	422
Peter Western, Ascot Park (White Leghorn)	142	415
Herbert Oliver, McLaren Vale (Black Orpington)	140	442
Lyol Stone, Morphett Vale (Black Orpington)	138	443
Malcolm Booth, Bridgewater (Black Orpington)	137	445
Peter Western, Ascot Park (White Leghorn)	135	416
Owen Robinson, Ascot Park (White Leghorn)	133	424

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
B. Cooke, Kanmantoo.	1	88	
	2	95	
	3	121	304
	4	123	
	5	144	
	6	134	401
			705
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A H. Matthews, Bridgewater	13	129	
	14	—	
	15	144	273
	16	147	
	17	116	
	18	79	342
			615
H F. Muirson, Yundi.	19	dead	
	20	103	
	21	71	174
	22	96	
	23	139	
	24	58	293
			467
E. McKee, 5, Rose Street, Carrondown.	25	114	
	26	dead	
	27	165	279
	28	151	
	29	148	
	30	145	444
			723
H. C. Stacy, Meadows.	31	86	
	32	78	
	33	152	316
	34	49	
	35	117	
	36	159	325
			641
T. Cleaver, Bridgewater.	37	60	
	38	95	
	39	89	244
	40	129	
	41	91	
	42	108	328
			572
C Sandstrom, Yundi.	43	114	
	44	dead	
	45	dead	114
	46	68	
	47	73	
	48	124	265
			379
A. J. Monkhouse, Woodside.	49	68	
	50	142	
	51	127	337
	52	147	
	53	89	
	54	121	357
			694
J. F. Smith, Meadows.	55	113	
	56	100	
	57	7	220
	58	94	
	59	20	
	60	128	242
			462
A. Young, Bridgewater.	61	138	
	62	122	
	63	114	374
	64	85	
	65	145	
	66	114	344
			718
R. W. McAlister, Yundi.	67	60	
	68	104	
	69	123	287
	70	93	
	71	59	
	72	117	269
			556
T. Duhring, Mallala.	73	145	
	74	dead	
	75	97	242
	76	58	
	77	68	
	78	84	210
			452
R. J. Underdown, Meadows	79	43	
	80	82	
	81	144	269
	82	96	
	83	78	
	84	134	308
			577
S. Hill, Bridgewater.	85	97	
	86	139	
	87	113	349
	88	131	
	89	138	
	90	115	384
			733
W. R. Hedger, Yundi.	91	79	
	92	100	
	93	108	287
	94	106	
	95	85	
	96	108	299
			586

Egg-laying Competition—*Continued.*

Competitor	Bird No.	First Grade Eggs. Progressive Totals 17th Nov., 1935	
Langmaid & Bettison, Salisbury	97	89	
	98	53	
	99	82	224
	100	127	
	101	66	
	102	2	195
			419
E. Portlock, Meadows.	103	143	
	104	120	
	105	124	387
	106	104	
	107	93	
	108	115	312
			699
Murray Powell, Jupiter Creek.	109	146	
	110	47	
	111	128	321
	112	103	
	113	149	
	114	37	289
			610
G. W. Bignell, Meadows	115	131	
	116	101	
	117	102	334
	118	79	
	119	130	
	120	131	340
			674
W. M. Field, Yundi.	121	117	
	122	29	
	123	100	246
	124	76	
	125	65	
	126	130	271
			517
C R. Wharton, Meadows	127	120	
	128	130	
	129	141	391
	130	138	
	131	121	
	132	115	374
			765
H. H. Hefford, Murray Bridge.	133	107	
	134	137	
	135	121	365
	136	50	
	137	133	
	138	93	276
			641
F. W Gage, Meadows.	139	107	
	140	4	
	141	dead	111
	142	120	
	143	95	
	144	82	297
			408
W. H. L. Norman, Echunga.	145	77	
	146	63	
	147	—	140
	148	147	
	149	102	
	150	59	308
			448

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
B R. Whittington, Yundi.	151	111	
	152	76	
	153	105	292
	154	127	
	155	114	
	156	98	339
			631
B C Sanders, Meadows	157	129	
	158	138	
	159	142	409
	160	126	
	161	68	
	162	dead	194
			603
H H Gallagher, Pooraka	163	59	
	164	dead	
	165	116	175
	166	90	
	167	60	
	168	131	281
			456
W. Sickert, Meadows.	169	151	
	170	89	
	171	143	383
	172	100	
	173	124	
	174	143	367
			750
W Restall, Echunga	175	75	
	176	—	
	177	91	166
	178	126	
	179	110	
	180	106	342
			508
A G Dawes, 230, Portrush Road, Glenunga.	181	136	
	182	107	
	183	107	350
	184	82	
	185	83	
	186	136	301
			651
G. W Sykes, Yundi	187	124	
	188	82	
	189	68	274
	190	93	
	191	90	
	192	129	312
			586
R. Bartley, Meadows	193	80	
	194	146	
	195	115	341
	196	86	
	197	114	
	198	129	329
			670
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury	199	74	
	200	106	
	201	71	251
	202	116	
	203	82	
	204	77	275
			526

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
J. J. Devlin, Meadows.	205	120	
	206	120	
	207	153	393
	208	123	
	209	99	
	210	151	373
			766
D. J. Foxwell, Echunga.	211	113	
	212	101	
	213	43	257
	214	17	
	215	117	
	216	47	181
			438
F. J. Buck, Meadows.	217	113	
	218	125	
	219	154	392
	220	80	
	221	104	
	222	90	274
			666
J. A. Grist, Yundi	223	27	
	224	68	
	225	101	196
	226	43	
	227	—	
	228	103	146
			342
L. A. King, Meadows.	229	137	
	230	125	
	231	dead	262
	232	32	
	233	72	
	234	19	123
			385
R. W. Sando, Echunga.	235	97	
	236	68	
	237	76	241
	238	102	
	239	95	
	240	86	283
			524
E. W. Young, Meadows.	241	140	
	242	104	
	243	113	357
	244	115	
	245	—	
	246	64	179
			536
A. Jarvis, Yundi.	247	111	
	248	61	
	249	96	268
	250	121	
	251	97	
	252	151	369
			637
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
S. Bridge, Yundi.	259	120	
	260	136	
	261	113	369
	262	70	
	263	118	
	264	104	292
			661
H. G. Egarr, Meadows.	265	107	
	266	81	
	267	25	213
	268	20	
	269	104	
	270	41	165
			378
R. H. Smith, Yundi.	271	126	
	272	95	
	273	121	342
	274	141	
	275	41	
	276	125	307
			649
J. M. Lawson, Meadows.	277	132	
	278	137	
	279	105	374
	280	80	
	281	123	
	282	64	267
			641
J. O. Marshall, Yundi.	283	12	
	284	115	
	285	126	253
	286	127	
	287	127	
	288	82	336
			589
G. Joyce, Meadows.	289	14	
	290	154	
	291	71	239
	292	85	
	293	141	
	294	103	329
			568
J. A. Bradtke, Yongala.	295	12	
	296	—	
	297	112	
		124	
W. H. A. Hodgson, Salisbury.	298	146	
	299	131	
	300	134	
		411	
A. W. McDonald, Gawler.	301	54	
	302	113	
	303	118	
		285	
J. H. Dowling, Glossop.	304	103	
	305	130	
	306	21	
		254	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
A. P. Urlwin, Balaklava.	307	104	
	308	87	
	309	21	
		212	
L. S. Ekers, Mount Compass	310	114	
	311	34	
	312	127	
		275	
V. E. Williams, Semaphore Park	313	135	
	314	134	
	315	136	
		405	
F. P. Munzberg, Tanunda.	316	134	
	317	122	
	318	135	
		391	
Total Class 1		29,467	
Class 2—Any Other Light Breed.			
Langmaid & Bettison, Salisbury. (Black Minorcas)	319	97	
	320	65	
	321	120	
		282	
A. Heaysman, Government Road, Eden Hills. (Cuckoo Leghorns.)	322	114	
	323	152	
	324	79	
		345	
Total Class No. 2		627	
Class No. 3—Black Orpingtons.			
A. G. Dawes, 230, Portrush Road, Glenunga.	325	49	
	326	26	
	327	134	209
	328	86	
	329	90	
	330	109	285
			494
H. J. Mills, 108, Edward Street, Edwardstown.	331	131	
	332	114	
	333	114	359
	334	105	
	335	131	
	336	dead	236
			595
K Pennack, Pooraka.	337	119	
	338	99	
	339	57	275
	340	143	
	341	53	
	342	89	285
			560
H. H. Gallagher, Pooraka.	343	108	
	344	85	
	345	95	288
	346	116	
	347	93	
	348	83	242
			530
B. Cooke, Kanmantoo.	349	25	
	350	42	
	351	29	
		96	
H. H. Hefford, Murray Bridge.	352	109	
	353	80	
	354	54	
		243	
J. H. Dowling, Glossop.	355	83	
	356	33	
	357	112	
		228	
L. S. Ekers, Mount Compass.	358	103	
	359	68	
	360	119	
		290	
A. G. Dawes, 230, Portrush Road, Glenunga.	452	72	
	453	96	
	454	91	259
	455	24	
	456	118	
	457	107	249
			508
A. P. Urlwin, Balaklava.	465	85	
	466	120	
	467	96	
		301	
Total Class No. 3		3,749	
Class No. 4.—Any Other Heavy Breed.			
H. J. Mills, 108, Edward Street, Edwardstown. (Rhode Island Reds.)	361	1	
	362	dead	
	363	67	68
	364	164	
	365	99	
	366	dead	263
			331
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	367	73	
	368	101	
	369	70	244
	370	111	
	371	63	
	372	92	266
			510
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens. (Rhode Island Reds.)	373	111	
	374	129	
	375	dead	240
	376	38	
	377	99	
	378	100	237
			477
V. F. Gameau, Findon Road, Woodville. (Rhode Island Reds.)	379	62	
	380	129	
	381	125	316
	382	102	
	383	25	
	384	79	206
			522

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
	385	107	
	386	91	
K. Pennack, Pooraka. (Barnevelders.)	387	81	279
	388	127	
	389	118	
	390	122	367
			646
	458	17	
	459	95	
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	460	107	219
	461	15	
	462	100	
	463	98	213
			432
Total Class No. 4			2,918

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.	
	391	130	
	392	56	
G. R. Cowell, Balhannah.	393	26	212
	394	67	
	395	46	
	396	113	226
			438
	397	39	
	398	122	
A. J. Monkhouse, Woodside.	399	116	277
	400	76	
	401	106	
	402	121	303
			580
	403	112	
	404	106	
G R. Cowell, Balhannah.	405	49	267
	406	103	
	407	70	
	408	dead	173
			440
Total Class No. 5			1,458

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.
	409	102
W. R. Christie, Upper Mitcham.	410	85
	411	94
		281
Total Class No. 7		281

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	108
	413	42
	414	87
		237
Total Class No. 8		237

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.
Peter Western, Ascot Park School. (White Leghorn.)	415	142
Peter Western, Ascot Park School. (White Leghorn.)	416	135
William Sando, Echunga School. (White Leghorn.)	417	117
Douglas Marshall, Yundi School. (White Leghorn.)	418	123
Norman Page, Murray Bridge School. (White Leghorn.)	419	119
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	109
Dean Colwell, Grange School (White Leghorn.)	421	97
Warren Hannaford, Paracombe School. (White Leghorn.)	422	145
W. Horne, Woodville School. (White Leghorn.)	423	dead
Owen Robinson, Ascot Park School. (White Leghorn.)	424	133
June Chapman, Woodchester School. (White Leghorn.)	425	90
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	83
Jack O'Sullivan, Morphett Vale School. (White Leghorn)	427	111
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	57
James Taylor, Morphett Vale School. (White Leghorn.)	429	120
William Gregory, Victor Harbour School. (White Leghorn.)	430	101
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	98
Clifford Burford, Smithfield School. (White Leghorn.)	432	72
Tom Callaghan, Smithfield School. (White Leghorn.)	433	25
Eric Pratt, Abattoirs School. (White Leghorn.)	434	150
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	129
Alan Yelland, Cunliffe School. (Minorca.)	436	74
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	129

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 17th Nov., 1935.
Clarence King, Tarlee School (White Leghorn.)	438	74
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	105
Donald Heading, Sturt School. (Black Orpington.)	440	128
Clive Steer, Sturt School. (Black Orpington.)	441	118
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	140
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	138
Ray Candy, Noarlunga School. (Black Orpington.)	444	57
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	137
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	112
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	26
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	69
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	121
John Keldoulis, Orroroo School. (Black Orpington.)	450	110
Bruce Dooland, Thebarton School. (Black Orpington.)	451	89
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	77
Total		3,878

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April to 30th November.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 31st October, 1935	No. Eggs Laid Month of November, 1935.	Total Eggs Laid 1st April, 1935, to 30th November, 1935.
No. 1 Test	4,387	606	4,993
No. 2 Test	4,404	643	5,047
No. 3 Test	4,546	690	5,236
No. 4 Test	3,971	529	4,500
No. 5 Test	3,921	635	4,556

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE OF MURRAY LANDS EAST BRANCHES.

A strong north wind, accompanied with a severe dust storm, prevented many delegates from distant Branches from attending the Conference of Eastern Murray Lands Bureaux, which was held at Alawoona on 1st October. Mr. Wm. Paull (Alawoona) presided, the opening address being delivered by Mr. A. J. A. Koch (Member of the Advisory Board of Agriculture).

“The Changed Economic Value of Mallee Lands” was the subject of a paper presented by Mr. T B. Flint, of Alawoona. Mr. G. A. Thompson (Alawoona) contributed a paper, “Silage and Side Lines.”

Conference carried the following resolutions:—“That the 1936 Conference be held at Alawoona”; “That the Government be asked to take steps to control the fox menace by proclaiming destruction periods prior to lambing, and it is suggested that scalps be paid for to encourage destruction”; “That this Conference considers that no scheme of debt adjustment will be acceptable or practicable unless security of tenure and a payable price for wheat are guaranteed, and that all revaluations and investigations are carried out by practical men who are farmers”; “That in view of the valuable information obtained by Mr. Spafford during his trip overseas, this Conference asks the Government to send at least one officer of the Department abroad each year.”

At the evening session Mr. W. J. Spafford (Deputy Director of Agriculture) gave an address illustrated with lantern views on his trip overseas.

CONFERENCES OF EYRE'S PENINSULA BRANCHES.

Branches of the Agricultural Bureau in the Eastern, Lower, and Central districts of Eyre's Peninsula held Conferences at Butler, Yeelanna, and Wudinna respectively on 8th, 16th, and 18th October. Each Conference was attended by Messrs. W. J. Spafford (Deputy Director of Agriculture) and H. C. Pritchard (General Secretary). Messrs. H. B. Barlow (Chief Dairy Instructor) and H. D. Adams (Agricultural Instructor) were present at Butler and Yeelanna; Mr. S. Shepherd (Advisory Board of Agriculture) at Yeelanna and Wudinna; Mr. C. A. Goddard (Assistant Wool Instructor, School of Mines) at Yeelanna; and Mr. W. H. Brownrigg (Agricultural Instructor) at Wudinna.

Mr. Spafford gave an address (illustrated with lantern views) at the evening session of each Conference on “A Trip Through the Southern Hemisphere.”

Butler Conference.

Mr. H. Tilley presided over the Butler Conference, which was formally opened by Mr. Spafford. The following papers were read by members:—“Fodder Conservation on the Farm,” Mr. C. F. Jericho, Butler; “Wheat Farming *versus* Sheep,” Mr. J. Crooks, Taragoro; “Breeding Fat Lambs on Eyre's Peninsula,” Mr. E. J. Barraud, Lipson; “Some Suggestions for Eyre's Peninsula Farmers,” Mr. F. Masters, Verran; “The Advantages of Crop Competitions,” Mr. N. G. Stewart, Butler.

The General Secretary undertook to make further inquiries into complaints that the quantity of superphosphate supplied by the Farmers' Assistance Board was not in accordance with that recommended by the Agricultural Instructors.

Resolutions carried were:—"That the attention of the Port Lincoln District Council be drawn to the spread of St. John's Wort, and that early steps be taken for the eradication of this weed"; "That the Port Lincoln Bacon Factory be asked to purchase pigs at live-weight on the hoof, as is done by some other firms in this State; "That the next Conference be held at Kimba."

Yeelanna Conference.

The Conference at Yeelanna was opened by Mr. S. Shepherd, and Mr. L. E. Clarkson presided. Papers were given by Mr. J. H. Vigar, Mount Hope, on "Tree Culture on the Farm"; Mr. A. Doley, Yeelanna, "The Problem of Soil Erosion"; Mr. J. Carter, Koppio, "Can a Profit over Expenditure be Obtained in Growing Feed, especially for the Production of Wool at 1s. per pound?"; Mr. R. W. Pearson, Yeelanna, "Farm Book-keeping"; Mr. R. Schultz, Koppio, "Preparing Beeswax for Comb Foundations"; Mr. Ray Proctor, Yeelanna, "Preparing Land for Seeding."

The following resolutions were carried:—"That a stock inspector be stationed on Lower Eyre's Peninsula, with the object of eradicating lice and tick from sheep"; "That this Conference forward a resolution to the Government that in future lamb seasons the Port Lincoln Freezing Works provide means of treating more lambs daily than they are accommodating this season"; "That more information concerning the ultimate disposal of resolutions submitted to Conference be forwarded to Conference Branches after such resolutions have been disposed of"; "That the next Conference be held at Yeelanna."

A visit was made to the farm of Mr. R. R. Wilson in order to inspect the experimental plots and dairy stock. Mr. Barlow gave an address on points of a dairy cow, using Mr. Wilson's stock for demonstrating his remarks.

Wudinna Conference.

Mr. A. W. H. Barnes was Chairman of the Wudinna Conference, and Mr. S. Shepherd delivered the opening address.

Mr. C. Johns, Wudinna, read a paper on "Some Aspects in the Bulk Handling of Wheat"; Mr. O. J. Murphy, Warramboo, "Treatment of Fallow"; Mr. Max O'Brien, Wudinna, "Management of the Farm Flock"; Mr. C. H. Edmonds, Pygery, "Could the System of Farming, as practised in this district, be reviewed."

Resolutions were:—"That a further 50 per cent. concession on present freight charges on sires of farm stock be allowed by the Government"; "That a market for fat stock be established at Port Lincoln, to be worked on the same lines as the abattoirs, in conjunction with the Port Lincoln Freezing Works"; "That the acreage wheat bounty be the same as last year, and the bushel bounty be pooled in order to provide the same price at country sidings as first-class sea ports"; "That the Advisory Board send a circular to farmers in the Central Conference District, asking them to endeavour to have export lambs ready by 1st September each year"; "That this district be proclaimed a compulsory dipping area"; "That this Conference is in favour of bulk handling of wheat, preferably on the system adopted in Western Australia"; "That no low grade milling wheat be eligible for competitions, and that the Advisory Board be requested to use its influence to eliminate the growth of low grade milling wheats"; "That the next Conference be held at Minnipa."

FRUIT GROWERS CONFERENCE AT LYNDOCH.

Branches of the Agricultural Bureau whose activities are devoted to fruit growing in the non-irrigated districts of the State, met in conference at Lyndoch on 5th November, delegates being present from Light's Pass, Greenock, McLaren Flat, Blackwood, Williamstown, and Lyndoch.

Mr. E. N. Evans (Lyndoch) presided and Mr. W. J. Spafford (Deputy Director of Agriculture) delivered the opening address, in the course of which he drew attention to the great horticultural potentialities of some of the countries that he had visited during his tour of the Southern Hemisphere.

The competition that would inevitably come from these countries when their orchards and vineyards were in full bearing, he believed could only be met by Australia exporting produce of the best quality.

Mr. J. S. Hammat (Lyndoch) read a paper on ''Some Observations of the Control of Codlin Moth,'' and Mr. B. Boehn (Light's Pass) contributed an excellent paper on ''Manuring Vines.''

The following resolutions were carried:—

> ''That growers get into touch with their district instructors with a view to having further investigations made into die-back of apple trees.
>
> ''That a greater sum be paid to the Fruit Industry Sugar Concession Committee in order to stabilise the fruit industry.''
>
> ''That a viticultural instructor be appointed for the non-irrigated vine growing areas.''
>
> ''That an experimental orchard and vineyard be established in connection with the Nuriootpa High School.''
>
> ''That a geological survey of the district be made in connection with water for irrigation and prevalence of frost.''

It was decided that the decision as to the place of the 1936 Conference should be left in the hands of the Advisory Board.

Through the courtesy of Messrs. G. Gramp & Sons Ltd., delegates to the Conference were afforded the opportunity of inspecting the Orlando Wine Cellars.

The evening session was occupied with an address, ''A Trip Through the Southern Hemisphere,'' illustrated with lantern slides, delivered by Mr. Spafford.

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ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, 27th November, 1935, there being present Messrs. A. L. McEwin (Chairman), H. N. Wicks, F. Coleman, Geo. Jeffrey, A. M. Dawkins, Dr. A. E. V. Richardson, and H. C. Pritchard (Secretary).

Apologies were received from Messrs. J. B. Murdoch, A. J. A. Koch, P. J. Baily, S. Shepherd, and Professor A. J. Perkins.

New Members.—Approval was given to the addition of the following names to the rolls of existing Branches:—Balhannah Women's—Miss D. Robinson, Miss Morris; Bundaleer Springs—G. Seal, J. Rundle; Caliph—F. Richards; Chandada—Martin Dreckow, P. A. H. Danenberg, O. C. Danenberg, John Horsell, R. J. Evans; Chilpuddie Rock— — McMahon; Coonalpuna—M. Hissey, N. Mincham, F. McMahon; Echunga—A. J. Feder, Arthur Hampton; Eurelia Women's—Mrs. C. Dowd, Mrs. F. Stainer, Mrs. A. G. Polden, Mrs. J. Polden, Mrs. C. Phillis; Frayville—H. A. Krause; Gladstone Women's—Mrs. L. O. Robertson; Hilltown—L. J. Ashton, J. Humphries; South Kilkerran—H. Zacher; Kybybolite Women's—Mrs J. Lester, Mrs. H E. Wilkes, Miss E. M. Wilkinson; Lameroo—G. Morris, H. M. Morris, H. J. Blake; Lone Gum and Monash—W. Carter, L. Stratman, G T. Evans, G. J. H. Smith; Millicent Women's—Mrs. E. C. Hutchesson, Mrs J. Allen; Morchard- H. Brown; Morchard Women's—Mrs. L. Wilks, Mrs. L. Nottle, Miss I Pitchers, Mrs. C. Halliday (jun), Miss J. Irvine; Mount Bryan—A. Schenscher, T. P. Griffin, H. Griffin, C. Rawlins, J. Hooper, E. C. Collins, E. A. Blight, C. Seebohm; Mount Compass—David Black, Eric Webster, — Jurgins; Mount Pleasant—J. H. Buckley, D. Buckley, P. B. Haeusler, H McD. Verrall, G. A. Deane, Phil. Chapman, L. F. Rollond; Mudamuckla Women's—M. S. M. Stasinowsky; Murray Bridge—Frank W. Hambridge; Murraytown—R. A Tregenza, H. R. Phillis; Mypolonga—L. Lace, P. H. Pickering; Roseworthy—F. Bammann; Sheaoak Log Women's—Mrs W. Both; Strathalbyn—George Semple; Truro—R. Schliebs, F. E Winton; Ungarra—J. R. Schramm, G. Lawrie, A. Lawrie, A Brechin, J. Duffield, W. G. Gordon, J. Gordon, J. G. Jericho; Warcowie Women's—Miss E. H. Telfer; Wasleys Women's—Mrs. R. Duffield; Watervale—R. J. Graham, K. Nicoli; Williamstown—W. R. Parmenter, D. Manser, F. E. Rix, H. J. Spencer, E. Gottwald, W. C. Smith, A. Bain, C. G. Fromm, A. T. Leske, Sid. Coleman, F. Gangel; Willowie—R. A. Barrie; Wirrabara—T. Cockburn, D. Milne, O Jaeschke, G. Stevens.

Members of New Branches.—Devlin's Pound -A. G. Robertson, G. O. Roxall, C. R. Smith, H. A. Loffler, A. W. Neindorf, John Chesney, R. A. Loffler, R. Zehender, G. A. Chesney, T. A. Cain, Jack Loffler, Max Hunger, R. K. Albrecht, K G. Albrecht, S. A. Pickering, J. E. Pickering, O. A. Peterson, T. J. Cain, W. Hammerling, O. P. Muehlberg, F. W. Huesler; Devlin's Pound Women's—Mrs. C. Smith, Mrs. J. L Loffler, Mrs. Zehender, Mrs. — Loffler, Miss J. Smith, Miss R. Koop, Mrs. G. Chesney, Mrs. H. A. Loffler, Miss E. Glastonbury, Mrs. S. Pickering, Mrs. W. Huesler, Mrs. E. Doig, Miss D. Doig, Miss E. Peters.

Life Members.—Approval was given to the addition of the name of Mr. C. B. Pope (Mount Barker) to the roll of Life Members of the Agricultural Bureau.

Minnipa Farm.—The Minister intimated that he had dealt with the re opening of the Minnipa Farm as a seed wheat station with the Director of Agriculture, and stated that the question of re-starting the Experimental Farm would be considered in April, 1936.

Soil Erosion.—The Secretary reported that the Director, Local Government Department, had sent a circular to all district councils drawing attention to Congress resolution recommending conserving and planting trees. The Director pointed out that the area of reserves and roadsides under councils' control was considerable, and that the Minister urged on councils the necessity for safeguarding trees and native shrubs in such locations, and of inaugurating a system of tree planting wherever conditions were suitable. Received.

St. John's Wort (Butler Conference).—The district clerk at Port Lincoln intimated, in response to a resolution of the Butler Conference, forwarded through the Board, that notice had been served on landholders to destroy St. John's Wort on their property, and that further action would be taken to have the weed eradicated.

Duty on Wire Netting (Congress Resolution).—"That Congress urge the Federal Government to remove the duty from imported wire netting or substantially reduce same." The Secretary reported the present duty was 200s. general tariff; British preferential tariff, free; primage and sales tax, nil. Decided to advise Branches accordingly.

Sheep Dipping (Wudinna Conference).—"That this district be proclaimed a compulsory dipping area." Koppio Branch.—"That this Branch request the Stock and Brands Department to station a permanent stock inspector on Eyre's Peninsula to check breaches of the Brands Act, and to take action for the eradication of lice and tick in sheep." Yeelanna Conference.—"That a stock inspector be stationed at Lower Eyre's Peninsula with the object of eradicating lice and tick from wool." Decided to forward the resolutions on to the Minister with the support of the Board.

Die-back of Apple Trees (Fruitgrowers' Conference at Lyndoch).—"That growers get into touch with their district instructors with a view to having further investigations made into die back of apple trees." Decided to inform Branches accordingly.

Foxes (Murray Lands (East) Conference).—"That the Government be asked to take steps to control the fox menace by proclaiming destruction periods prior to lambing, and that it is suggested that scalps be paid for to encourage destruction." The Secretary reported he had approached the vermin board department, which stated that the Act provided for simultaneous destruction of vermin. The term "vermin" included foxes. The periods for simultaneous destruction in the Brown's Well district council and other councils in that direction were 1st to 14th March and 1st to 14th August. There was no "scalp" money for foxes. Decided to advise the Branches concerned accordingly.

Young People's Employment Council.—Dr. Richardson reported he had attended two meetings of the Young People's Employment Council when the three following resolutions were carried:—(1) "This Conference recommends that a survey be made on the absorptive capacity for employment in existing industries, and the potential scope for the development of new industries." (2) "This Conference considers that more encouragement should be given to boys to give preference for agricultural pursuits, and that the Government be asked to investigate the possibilities for closer settlement in regions of assured rainfall." (3) "This Conference is of the opinion that family land settlement provides the best means of rehabilitating unemployed married persons and their families." Dr. Richardson was thanked for his interest and attendance at these meetings.

Several items were taken in Committee.

ESA BLUESTONE
MANUFACTURED BY
THE ELECTROLYTIC REFINING AND SMELTING COMPANY OF
AUSTRALIA LIMITED, PORT KEMBLA, N.S.W.
Guaranteed to contain not less than 99% Sulphate of Copper.

USE IT— In preparation of Spray Mixtures for Fruit Trees and Vines.
For Treatment of Foot-rot in Sheep. For Wheat Pickling

Agents for all States:
ELDER SMITH & Co., Limited. All Capital Cities.
Write for Booklet—"Better Yields by Spraying with ESA Bluestone."

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on 2nd December, 1935:—

BUTTER.—The tonnage of butter manufactured during November was well maintained, and in the aggregate was 25 per cent. to 30 per cent. greater than for the corresponding period last year. This result was largely due to the fact that the weather was congenial throughout, and except for a day or two of warm weather now and again conditions were cool. Trade in print butters was well maintained in the metropolitan area, and regular shipments of butter in bulk were made to Britain. Market fluctuations there were acute, and after the upward trend came back rather suddenly. At moment values for Australian choicest on spot are 97s to 98s. per cwt., and local rates are:—Choicest creamery fresh butter. in bulk, 1s. 3¼d. per lb. Prints and delivery extra. (This price is for local sale only and, under the quota system the equalised price manufacturers will receive will be 12.09375d. per lb. on which basis payments to cream suppliers will be calculated.) Separator lines from 10½d. to 11½d. per lb for choicest; stores, 6d. to 8d. per lb. (These prices are subject to equalisation levies.)

CHEESE.—This commodity also has been manufactured in record quantities this season, and apart from the local and Western Australian trade heavy shipments were made to London and other ports of Britain, and the South Australian cheese is meeting with favour in these markets. Local rates are:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. 1d. to 1s. 1½d. per lb.

EGGS.—Many difficulties were encountered in connection with egg exports this season, and very stringent conditions were imposed by the Commonwealth authorities so that the quantities shipped overseas will be very much less this year. Consequently, a greater proportion of the supplies have been manufactured into egg pulp, and market is weak at:—Ordinary country eggs, fair average quality, from 3½d. per doz. net; long distance rail or shipping eggs, lower; selected new laid, clean eggs, full sized, 7½d. to 8d. per doz. net.

BACON.—With the general warm weather conditions the consumption of bacon was satisfactorily maintained, and all requirements were met by the consignments received from the factories, and values continue steady. The sale for hams has improved as is usual for this time of the year, and much heavier bookings were made for Christmas delivery. Values are:—Best quality sides, 9½d to 9¾d. per lb.; middles, 9½d. to 10d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 1s. 2½d. to 1s. 3d ; cooked, 1s. 4½d. per lb.; lard, bulk, 5d. to 5½d.; prints, 6d. to 6½d. per lb.

ALMONDS.—After a period of short markets quantities increased, but sales kept the floors fairly cleared, and rates are:—Softshells and Brandis, 9d. to 10d ; hardshells, 5¼d. to 5½d.; kernels, 1s. 11d. to 1s. 11½d. per lb.

HONEY.—Unfortunately there is no improvement to report in the sale of honey, and very heavy stocks are still held. Present values are:—Prime quality clear extracted 2¼d. to 2¾d. per lb.; lower grades, 1d. to 2d per lb.

BEESWAX.—Was in fairly heavy supply, and turnover was steady at 1s. 3d. to 1s. 4d. per lb, according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms, which are in every way the best equipped in the State. The catalogues submitted during November were shorter than usual, the supplies of young cockerels, turkeys, and ducks being much less than was expected. There was a slight increase towards the latter end of the month, and no doubt will continue to improve throughout December, especially during the Christmas sales. Prices for prime quality stock are expected to rule high. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 4s. to 5s. 6d.; nice-conditioned cockerels, 3s. 3d. to 3s. 11d.; fair-conditioned cockerels, 2s. to 3s. 2d.; chickens, lower; heavyweight hens, 2s. 6d. to 3s.; medium hens, 1s. 4d. to 2s.; light hens, 1s. to 1s. 3d.; couple of pens of weedy sorts, lower; prime young muscovy drakes, 5s. 6d. to 6s. 6d.; young muscovy ducks, 3s. to 4s.; ordinary ducks, 1s. to 2s. 3d.; ducklings, lower. Geese, 3s. 4d. to 5s. 6d.; goslings, lower. Turkeys, good to prime condition, 10d. to 1s. 1d. per lb. live weight; turkeys, fair condition, 7d. to 9d. per lb. live weight; turkeys, poor and crooked breasted, lower. Pigeons, 5½d. to 6½d. each.

POTATOES.—New season's, 8s. per cwt.

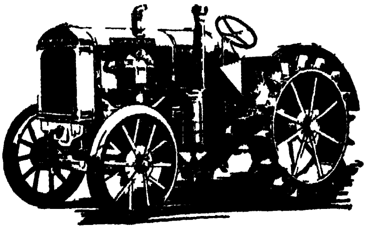
ONIONS.—New season's, 8s. per cwt.

MODERN as the day—
this reliable
FARM EQUIPMENT

Built on long and close experience of farming requirements, these practical lines give you the best that modern engineering skill can devise. Your local McCormick-Deering agent will be pleased to show you their qualities.

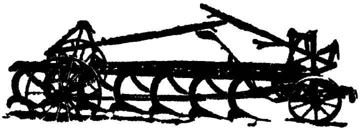
McCORMICK-DEERING W-30 TRIPLE-POWER TRACTOR

The new McCormick Deering W-30 triple-power tractor is strikingly individual in type and character With a turning radius of only 13½ feet, W-30 is distinguished by unusual power and stamina for a tractor of its compact dimensions. Built like a motor car, it has special gears and anti friction bearings on the steering shaft and steering knuckles making it one of the easiest of all tractors to steer



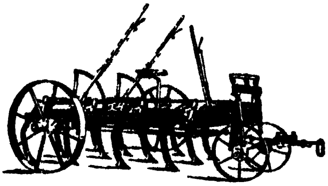
McCormick-Deering W-30 Tractor

McCORMICK-DEERING STUMP-JUMP MOULDBOARD PLOUGHS.



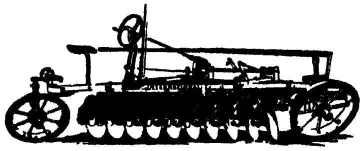
Made in 5 and 7 furrow sizes, these ploughs can be adjusted to cut 6, 7 and 8 inch furrows Yielding springs allow the jump beams to yield sideways when striking an obstruction For operation with tractor a special power-lift attachment can be supplied at extra cost

INTERNATIONAL STUMP-JUMP SCARIFIERS.



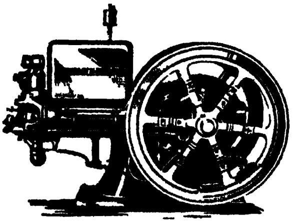
Made in 5, 7, 9 and 11-ft. sizes, the International stump-jump scarifier has many serviceable features. It has ample clearance, is easy to operate—direct and positive in action. A splendid implement for cultivating fallow land Can be equipped for use with horses or tractor

INTERNATIONAL DISC CULTIVATING PLOUGHS.

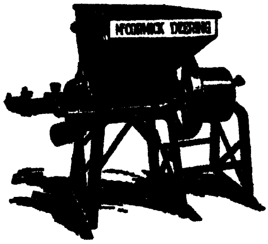


The International "single jump" disc cultivating plough is made in 6, 8, 10 and 12 furrow sizes, equipped with 22-inch discs spaced 9½ inches apart. Width of cut can be varied from 5½ to 7 inches. This plough can be equipped for operation with horses or tractor

McCORMICK-DEERING KEROSENE ENGINES.



Operating on kerosene fuel at low cost, the McCormick Deering engine is the ideal mechanical 'handy man" on the farm Built in 1½ 3 and 6 h.p sizes Stationary and portable types



McCormick-Deering Feed Grinder

McCORMICK-DEERING FEED GRINDERS.

McCormick-Deering feed grinders are made in 6 and 8-inch sizes with capacities to suit any farm; will grind maize on the cob and crush the cobs; will also grind small grain and shelled maize. The 6-inch feed grinder has a capacity of 9 to 48 bushels an hour, and the 8-inch machine a capacity of 18 to 72 bushels an hour.

INTERNATIONAL HARVESTER COMPANY
OF AUSTRALIA PTY. LTD.
(INCORPORATED IN VICTORIA)
113-114 NORTH TERRACE, ADELAIDE

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING OCTOBER, 1935.

IMPORTS.

Interstate.

Apples (bushels)	154	Plants (packages)	74
Bananas (bushels)	17,189	Seeds (packages)	38
Citrus—		Trees, Fruit (packages)	7
Grape Fruit (bushels)	45	Trees, Ornamental (packages)	2
Lemons (bushel)	½	Wine Casks (No.)	3,287
Oranges (bushels)	9		
Passion Fruit (bushels)	116½	*Fumigated*—	
Paw Paws (bushels)	6	Citrus—	
Pears (bushel)	½	Grape Fruit	20
Pineapples (bushels)	2,122½	Trees, Fruit (packages)	2
Peanuts (bags)	1,084	Trees, Ornamental (packages)	2
Peanuts, Kernels (bags)	46	Wine Casks (No.)	44
Beans (bushels)	82		
Cucumbers (bushels)	599	*Rejected*—	
Onions (bags)	65	Bananas (bushels)	45
Potatoes (bags)	20,961	Pineapples (bushels)	15
Swedes (bags)	7	Beans (bushels)	9
Bulbs (packages)	14	Potatoes (bags)	26
Moss (bags)	8	Secondhand Cases (No.)	1

Overseas.

(State Law).

Wine Casks (No.)	1,047

Federal Quarantine Act.

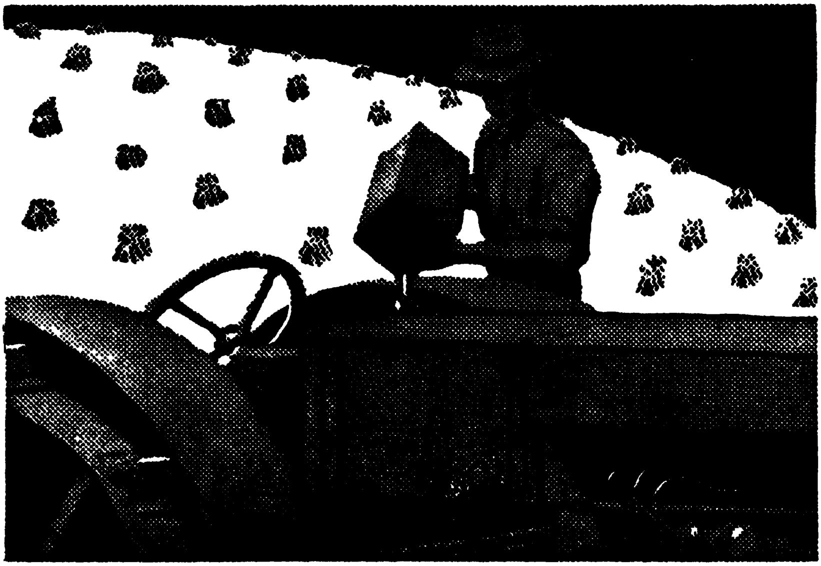
	Packages.	Lbs.		Packages.	Lbs.
Seeds, &c.	1,770	328,629	Plants	6	800 (No.)
Canes	206	—	Bamboos	100	—
Chests, Tea	2,872	—	Bulbs	1	20
Chests, Cocoanut	446	—	Handles, &c.	498	—
			Timber	300,142	13,004,364 super ft.

EXPORTS.

Federal Commerce Act.

		Packages.			Packages.
Cook Island	Trees, Fruit	4	New Zealand	Citrus—Oranges	41,782
England	Citrus—Oranges	14		Seed, Clover	96
Netherlands, East Indies	Citrus—Oranges	8	Singapore	*Vegetables	107
	*Vegetables	4	Straits Settlements	*Vegetables	6

* Potatoes excluded.



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RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of November, 1935, also the average precipitation for November, and the average annual rainfall.

Station.	For Nov., 1935.	Av'ge. for Nov.	To end Nov., 1935.	Av'ge. Annual Rainfall.
Far North and Upper North.				
Oodnadatta	0·13	0·36	4·03	4·66
Marree	0·27	0·44	4·28	5·88
Farina	0·19	0·49	4·25	6·43
Copley	0·22	0·55	3·16	7·87
Beltana	0·33	0·67	3·02	8·48
Blinman	0·41	0·86	4·18	11·86
Hookina	0·40	0·86	4·09	11·25
Hawker	0·25	0·93	5·35	12·26
Wilson	—	0·90	5·43	11·79
Gordon	0·15	0·83	5·11	10·53
Quorn	0·19	0·90	8·71	13·22
Port Augusta	0·42	0·69	8·49	9·44
Bruce	0·10	0·71	6·88	9·87
Hammond	0·13	0·77	7·39	11·21
Wilmington	0·27	1·01	11·01	17·32
Willowie	0·24	0·78	7·44	12·25
Melrose	0·29	1·26	18·42	22·88
Booleroo Centre	0·37	0·86	10·89	15·21
Port Germein	0·15	0·80	9·64	12·53
Wirrabara	0·17	1·11	14·77	19·29
Appila	0·25	0·88	12·59	14·65
Cradock	0·11	0·75	5·24	10·82
Carrieton	0·11	0·82	7·16	12·23
Johnburg	0·17	0·84	6·58	10·58
Eurelia	0·07	0·98	6·86	12·79
Orroroo	0·10	0·97	7·84	13·20
Nackara	0·32	0·85	7·05	11 09
Black Rock	0·09	0·93	0·71	12·37
Oodlawirra	0·19	1·01	6·25	11·68
Peterborough	0·26	0·99	8·59	13·22
Yongala	0·27	1·04	10·68	14·44
North-East.				
Yunta	0·19	0·79	6·12	8·55
Waukaringa	0·14	0·69	4·32	7·94
Mannahill	0·13	0·77	4·27	8·20
Cockburn	0·06	0·76	3·33	7·96
Broken Hill, N.S.W.	0·04	0·78	4·48	9·56
Lower North.				
Port Pirie	0·21	0·77	11·63	13·21
Port Broughton	0·16	0·73	13·68	13·88
Bute	0·17	0·75	13·46	15·44
Laura	0·11	1·06	15·00	17·95
Caltowie	0·11	1·12	11·82	16·74
Jamestown	0·19	1·15	13·44	17·69
Gladstone	0·12	1·05	14·29	16·29
Crystal Brook	0·05	0·91	15·48	15·78
Georgetown	0·11	1·03	13·87	18·37
Narridy	0·09	0·89	13·27	15·82
Redhill	0·15	0·87	16·19	16·59
Spalding	0·06	1·13	15·83	18·88
Gulnare	0·13	1·09	15·12	18·68
Yacka	0·06	0·84	14·05	15·39
Koolunga	0·12	0·81	13·06	15·38
Snowtown	0·16	0·88	14·41	15·74
Lower North—*continued.*				
Brinkworth	0·10	0·85	14·67	15·82
Blyth	0·17	0·93	16·23	16·78
Clare	0·24	1·30	22·55	24·51
Mintaro	0·23	1·15	20·13	23·42
Watervale	0·28	1·40	23·06	26·80
Auburn	0·23	1·33	21·69	23·98
Hoyleton	0·22	1·02	15·25	17·33
Balaklava	0·27	0·95	13·68	15·46
Port Wakefield	0·78	0·71	12·41	12·94
Terowie	0·20	0·93	9·06	13·35
Yarcowie	0·11	0·91	10·26	13·59
Hallett	0·06	1·06	14·58	16·46
Mount Bryan	0·03	0·90	15·99	16·83
Kooringa	0·10	0·93	15·36	17·85
Farrell's Flat	0·17	0·93	16·01	18·61
West of Murray Range.				
Manoora	0·28	1·00	16·98	18·92
Saddleworth	0·27	1·15	16·83	19·60
Marrabel	0·28	1·11	17·10	19·96
Riverton	0·28	1·23	19·90	20·81
Tarlee	0·34	1·14	16·00	18·10
Stockport	0·94	1·06	18·90	16·93
Hamley Bridge	0·73.	0·96	16·30	16·54
Kapunda	0·80	1·14	16·83	19·79
Freeling	0·73	1·06	17·53	17·83
Greenock	0·76	1·27	20·63	21·53
Truro	0·53	1·16	18·22	19·89
Stockwell	0·62	1·24	18·58	20·13
Nuriootpa	0·82	1·16	22·70	20·72
Angaston	0·78	1·29	20·71	22·42
Tanunda	1·05	1·20	23·20	22·02
Lyndoch	0·83	1·21	23·12	23·40
Williamstown	0·70	1·39	23·43	27·77
Adelaide Plains.				
Owen	0·60	0·87	15·65	14·66
Mallala	0·48	0·95	13·30	16·56
Roseworthy	0·79	1·02	17·80	17·40
Gawler	0·75	1·05	18·06	18·91
Two Wells	0·59	0·85	18·53	15·75
Virginia	0·73	0·96	17·31	17·18
Smithfield	0·78	1·04	18·04	17·64
Salisbury	0·67	1·04	17·33	18·56
Adelaide	0·91	1·15	22·29	21·15
Glen Osmond	0·89	1·25	25·07	26·05
Magill	0·94	1·26	24·35	25·53
Mount Lofty Ranges.				
Teatree Gully	0·85	1·48	24·70	27·20
Stirling West	1·66	2·14	49·27	47·08
Uraidla	1·15	1·93	38·59	44·19
Clarendon	1·23	1·55	33·53	23·88
Happy Val'y Res.	0·97	—	25·36	—
Morphett Vale	1·11	1·23	23·12	22·66
Noarlunga	1·18	1·03	21·27	20·37
Willunga	1·02	1·22	24·40	26·02
Aldinga	0·95	0·95	19·68	20·27

RAINFALL—*continued.*

Station.	For Nov., 1935.	Av'ge. for Nov.	To end Nov., 1935.	Av'ge. Annual Rainfall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	1·09	1·41	35·30	29·50
Inman Valley	1·23	—	32·50	—
Yankalilla	1·09	1·04	22·33	22·83
Mount Compass	1·58	—	—	—
Mount Pleasant	0·69	1·32	24·36	27·23
Birdwood	0·68	1·43	26·25	29·21
Gumeracha	0·84	1·66	30·44	33·41
Millbrook Res.	0·98	1·63	34·22	34·68
Tweedvale	0·89	1·62	36·45	35·99
Woodside	0·85	1·51	31·92	32·31
Ambleside	1·20	1·61	36·62	34·90
Nairne	0·95	1·42	28·43	28·22
Mount Barker	1·11	1·51	31·11	31·31
Echunga	1·31	1·60	35·77	33·30
Macclesfield	1·27	1·67	31·04	30·43
Meadows	1·23	1·88	35·60	36·16
Strathalbyn	1·03	1·08	21·48	19·31
MURRAY FLATS AND VALLEY				
Meningie	0·78	1·03	16·92	18·37
Milang	0·90	0·91	12·45	14·91
Langhorne's Ck.	0·96	1·03	14·88	14·87
Wellington	1·00	0·93	14·63	14·65
Tailem Bend	0·85	0·94	15·12	15·06
Murray Bridge	0·71	0·87	11·96	13·56
Callington	0·87	0·90	13·86	15·19
Mannum	0·55	0·70	11·70	11·49
Palmer	0·62	0·93	16·16	15·63
Sedan	0·50	0·70	9·51	12·11
Swan Reach	0·46	0·70	9·10	10·64
Blanchetown	0·35	0·74	7·89	11·01
Eudunda	0·36	1·08	15·37	17·17
Pt. Pass	0·27	0·79	15·44	—
Sutherlands	0·23	0·79	6·84	10·84
Morgan	0·24	0·64	6·07	9·17
Waikerie	0·10	0·67	6·98	9·65
Overland Corner	0·09	0·78	5·11	10·32
Loxton	0·15	0·72	6·80	11·54
Berri	0·07	0·57	7·15	10·17
Renmark	0·09	0·75	7·52	10·41
WEST OF SPENCER'S GULF				
Eucla	0·50	0·65	13·68	9·96
Nullarbor	1·11	0·55	14·56	8·81
Fowler's Bay	0·69	0·59	12·31	11·94
Penong	0·87	0·59	13·51	12·27
Koonibba	0·34	0·68	12·97	12·13
Denial Bay	0·78	0·55	11·91	11·36
Ceduna	0·67	0·65	13·08	10·16
Smoky Bay	0·69	0·49	11·76	10·53
Wirrulla	0·64	0·59	14·48	10·54
Streaky Bay	0·80	0·67	18·58	14·88
Chandada	0·65	0·79	14·00	—
Minnipa	0·70	0·74	14·73	14·06
Kyancutta	0·85	0·81	16·37	—
Talia	0·76	0·66	15·02	14·76
Port Elliston	0·45	0·70	17·15	16·54
Lock	0·96	1·01	17·55	16·52
Mount Hope	0·66	—	20·19	—
Yeelanna	0·46	0·67	19·13	15·94
Cummins	0·84	0·77	19·79	17·60
Port Lincoln	0·67	0·86	16·69	19·42
Tumby	0·94	0·86	14·60	14·12
Ungarra	0·66	0·95	17·78	16·85
Port Neill	0·60	0·88	13·83	13·09
WEST OF SPENCER'S GULF—*continued.*				
Arno Bay	0·69	0·74	14·99	12·65
Rudall	0·80	1·02	14·99	12·64
Cleve	0·98	0·93	18·36	14·83
Cowell	0·69	0·69	10·12	11·07
Miltalie	0·67	0·88	15·10	13·67
Mangalo	0·85	0·84	13·09	13·91
Darke's Peak	1·16	0·78	17·79	15·18
Kimba	0·60	0·67	13·50	11·82
YORKE PENINSULA.				
Wallaroo	0·39	0·72	12·95	13·98
Kadina	0·36	0·75	14·49	15·64
Moonta	0·56	0·76	13·23	15·06
Paskeville	0·39	0·74	13·37	15·49
Maitland	0·58	1·02	19·51	19·90
Ardrossan	0·52	0·77	13·85	13·97
Port Victoria	0·56	0·83	13·50	15·44
Curramulka	0·80	0·85	16·72	17·87
Minlaton	0·86	0·91	16·06	17·79
Port Vincent	0·74	0·78	13·50	14·43
Brentwood	0·60	0·86	16·99	15·55
Stansbury	0·85	0·84	16·45	16·82
Warooka	0·61	0·79	16·35	17·49
Yorketown	0·62	0·85	19·23	16·88
Edithburgh	0·64	0·89	16·25	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	1·06	0·98	28·24	24·82
Kingscote	1·59	0·91	24·59	19·14
Penneshaw	1·41	1·02	22·74	18·92
Victor Harbour	0·97	1·10	21·31	21·37
Port Elliot	1·09	1·10	17·90	19·93
Goolwa	0·93	1·06	15·98	17·85
Maggea	0·07	0·56	7·78	10·04
Copeville	0·44	0·73	10·50	11·51
Claypans	0·69	0·52	10·84	10·38
Meribah	0·11	0·53	7·99	11·31
Alawoona	0·03	0·52	8·29	10·36
Caliph	0·11	0·77	7·39	—
Mindarie	0·44	0·80	9·84	12·21
Sandalwood	0·56	0·89	12·28	13·66
Karoonda	0·78	0·75	14·00	14·36
Pinnaroo	0·60	1·00	9·08	14·43
Parilla	0·77	0·86	11·32	13·82
Lameroo	0·79	0·96	12·40	15·97
Parrakie	0·62	0·84	15·49	14·62
Geranium	0·69	0·94	16·17	16·51
Peake	0·90	0·84	17·19	16·01
Cooke's Plains	1·05	0·89	15·21	15·30
Coomandook	1·06	1·05	16·34	17·09
Coonalpyn	0·76	1·03	19·18	17·61
Tintinara	1·02	1·17	20·11	18·71
Keith	0·82	1·18	18·50	17·92
Bordertown	1·41	1·22	18·23	19·21
Wolseley	1·28	1·13	17·69	18·49
Frances	0·97	1·29	21·36	20·11
Naracoorte	1·35	1·38	23·66	22·66
Penola	1·28	1·54	23·42	26·01
Lucindale	1·65	1·21	27·96	23·34
Kingston	1·58	1·21	23·97	24·28
Robe	1·30	1·07	24·62	24·67
Beachport	1·17	1·16	27·06	27·09
Millicent	1·22	1·47	32·67	29·79
Kalangadoo	1·68	2·08	28·11	32·28
Mount Gambier	1·54	1·75	26·93	30·45

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Jan.	Feb.
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East		8	14
Alma		—	—
Angaston	*	—	—
Appila-Yarrowie		8	7
Arthurton		—	—
Ashbourne		8	5
Auburn Women's		31	28
Balaklava	*	R	24
Balhannah	*	—	—
Balhannah Women's	*	—	—
Balumbah	*	—	—
Balumbah Women's	718	R	R
Barmera	*	—	—
Baroota		13	10
Beetaloo Valley	*	6	3
Beetaloo Valley Women's		R	—
Belalie Women's	716	14	R
Belvidere	*	—	—
Berri		6	3
Blackheath		9	13
Black Rock	*	—	—
Black Springs	*	R	—
Blackwood	*	13	10
Block E	*	—	—
Blyth		24	28
Booborowie	*	6	3
Booleroo Centre		R	28
Boolgun	*	—	—
Boor's Plains		—	—
Boor's Plains Women's		R	—
Brentwood		6	3
Brimpton Lake		—	—
Brinkley		8	5
Brownlow	*	R	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	16	20
Butler	*	—	—
Calca	*	—	—
Caliph	*	7	4
Carey's Gully	*	—	—
Chandada	*	—	—
Chapman's Bore		R	10
Cherry Gardens		—	—
Chilpuddle Rock	*	—	—
Clare Women's		4	1
Clarendon	*	6	3
Collie	*	—	5
Coomandook		R	R
Coonalpyn	*	—	—
Coonalpyn Women's	*	—	R
Coonawarra	*	9	6
Coonawarra Women's		R	19
Cummins	*	R	14
Cungena	*	2	6
Currency Creek	*	13	10
Devlin's Pound	*	—	—
Devlin's Pound Women's	*	—	5
Dudley	*	—	—
Echunga	*	R	12
Eurelia	*	11	8
Eurelia Women's	*	—	5
Finniss	*	—	—
Frayville	*	R	—
Gawler River	*	—	—
Georgetown Women's		14	11
Gladstone	*	8	7
Gladstone Women's		21	18
Goode		R	R
Goode Women's	*	—	—
Green Patch		9	6
Greenock		20	17
Gumeracha	*	13	10
Hanson		7	4
Hartley		8	5
Hilltown		7	4
Hindmarsh Island	*	—	—
Hope Forest		6	3
Hope Forest Women's	*	—	—
Inman Valley		16	20
Iron Bank	*	8	5
Jamestown		15	19
Jervois	*	9	18
Kalangadoo	*	11	8
Kalangadoo Women's	—	11	8
Kangarilla Women's		16	20
Kanni	*	—	—
Karte		—	—
Karte Women's		—	—
Kelly		R	1
Ki Ki	*	—	—
Kilkerran	*	9	6
Koolunga	*	—	—
Koonunga		—	—
Koppio		8	5
Kulkawirra	*	4	11
Kyancutta	*	7	4
Kybybolite	*	9	6
Kybybolite Women's		—	—
Lameroo		4	1
Laura	*	11	8
Laura Bay		14	11
Laura Bay Women's	712	10	14
Lenswood and Forest Range	*	—	—
Light's Pass		—	—
Lipson	*	4	1
Lone Gum and Monash		16	20
Lone Pine		6	3
Longwood		—	—
Lyndoch	*	7	4
MacGillivray	*	7	4
McLaren Flat	*	—	—
McLaren Flat Women's	*	2	6
Maltee		9	6
Maltee Women's		—	—
Mangalo	*	—	—
Mangalo Women's		8	12
Marama	*	—	—
Milang		R	8
Millicent	*	24	28
Millicent Women's		R	R
Miltalie		R	1
Minnipa	*	—	—
Monarto South		—	—
Monarto South Women's		18	15
Moorlands	*	18	5
Moorook	*	—	—
Morchard	*	8	7
Morchard Women's		22	26
Mount Barker	*	20	17
Mount Bryan	*	—	—
Mount Compass	*	—	—
Mount Gambier		10	14
Mount Hope		7	4
Mount Pleasant	*	8	5
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Mudamuckla Women's		—	—

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Murray Bridge	*	—	—
Murraytown		—	—
Mypolonga	*	—	—
Myponga	*	16	20
Myponga Women's		16	13
Nantawarra	—	9	6
Narridy		R	1
Narridy Women's		—	—
Narrung	*	—	—
Nelshaby	—	—	—
Nelshaby Women's	—	—	—
Nunjikompita		9	6
Nunkeri	*	9	6
O'Loughlin	*	18	10
O'Loughlin Women's		—	—
Owen		18	10
Palabie	*	—	—
Parilla	*	21	18
Parilla Women's	*	15	19
Parilla Well	*	6	10
Parilla Well Women's	—	28	25
Parrakie	*	—	—
Parrakie Women's		28	25
Paskeville		7	4
Penola		4	1
Penola Women's		—	—
Penwortham		8	5
Petina	*	25	22
Pinbong		—	—
Pinbong Women's	*	—	—
Pinkawillinie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's		10	7
Port Elliot	*	—	—
Pygery		7	4
Pygery Women's	*	14	11
Ramco		6	3
Redhill		R	—
Rendelsham	*	4	1
Rendelsham Women's		—	—
Renmark	*	—	—
Riverton	*	18	10
Roberts and Verran	*	—	—
Rosedale		—	—
Roseworthy	*	—	—
Saddleworth	*	10	7
Saddleworth Women's		7	4
Scott's Bottom		4	1
Sheoak Log Women's		R	R
Shoal Bay	*	7	4
Snowtown	*	10	14
Snowtown Women's	714	2	6
South Kilkerran	—	R	3
Springton	*	—	R
Stanley Flat	*	20	17
Stockport		—	—
Strathalbyn	*	8	12
Sutherlands		R	—
Tantanoola		4	1
Tantanoola Women's		—	5
Taplan	*	R	R
Taplan Women's	*	—	—
Taragoro	*	9	R
Tarlee	*	—	—
Tatiara	*	—	—
Truro		R	17
Tweedvale		16	20
Tweedvale Women's	*	20	17
Ungarra	*	—	—
Upper Wakefield	*	—	—
Wallala	*	8	12
Wandearah		7	4
Warcowie		7	4
Warcowie Women's	720	—	R
Warramboo		R	4
Warramboo Women's	*	—	—
Wasleys		9	13
Wasleys Women's		2	6
Watervale	*	20	17
Weavers	*	18	10
Wepowie	*	6	8
Wepowie Women's	*	—	—
Whitwarta		20	R
Wilkawatt Women's	*	21	18
Williamstown		—	—
Williamstown Women's	*	—	5
Willowie	*	27	24
Wilmington		21	18
Wilmington Women's		R	13
Wirrabara	*	—	—
Wirrabara Women's		16	20
Wirrilla	*	R	6
Wirrilla Women's	*	2	6
Wolseley	*	R	8
Wudinna	*	—	—
Yadnarie	*	7	4
Yandiah		10	14
Yeelanna	*	8	5
Younghusband	*	—	—
Yundi		—	—
Yurgo	*	—	—
Yurgo Women's	*	—	—

* No report received during the month of November R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

WOMEN'S BRANCHES.

CORRECTION.

On page 567 of the November issue, the paper "Herbs, Spices and Condiments" is shown as having been prepared by Mrs. Edith Kidman; this should be Mrs. Thomas Kidman of Penola.

SUMMER DRINKS.

[Miss L. BLUMSON, Laura Bay.]

Summer home-made drinks are freely used in many homes during hot weather; especially do the farmers' wives take advantage of making the many different kinds of drinks which are simple and easy to make. *Boston Cream.*—3 pints boiling water, 1½ cups sugar, 2ozs. tartaric acid (powder), 1 teaspoon essence of lemon, white of 2 eggs. Pour boiling water over sugar, let it get cold, then add tartaric acid, whites of eggs beaten to a froth, and essence of lemon. Bottle and it is ready for use. Put 2 or 3 tablespoons in a tumbler of water. Add a pinch of carb. soda if liked. *Chilli Wine.*—2lbs. sugar, ½oz. tartaric acid, 1 quart boiling water, 25 to 50 chillies (according to size), 1 teaspoon essence of lemon. Boil chillies in water for 10 minutes, then strain on sugar and acid. Stir until sugar is dissolved, then lift off fire, and add essence of lemon; bottle. About 1 tablespoon to a glass of water. *Lemon Syrup.*—2lbs. white sugar, 3 pints boiling water, ½oz. tartaric acid, ¾ teaspoon essence of lemon, ½oz. cream of tartar. Pour boiling water on, and stir well. Let cool, and bottle. If wanted to keep long boil it 15 minutes. Two or 3 tablespoons to a glass of water. *Raspberry Vinegar.*—Boil 3 pints water, 3lbs. sugar. When cold add 1 cup vinegar, 2 teaspoons raspberry essence or more to taste. Colouring to taste. *Emperor's Orange Syrup.*—The peel of 8 oranges peeled very thinly, 5lbs. sugar, 1½oz. citric acid, 8 tumblers cold water. Put all together in an earthenware jar, and stir every hour with a wooden spoon; when the sugar is dissolved, strain and bottle. Use a small quantity with water added to taste. *Lime Juice.*—1½lbs. sugar, 1½ pints water, 3 teaspoons tartaric acid, ½ a small bottle of essence of lemon. Boil sugar and water, also acid, together for 1 hour; when cool add essence of lemon. *Good Fruit Salts.*—2ozs. each of tartaric acid, Epsom salts, cream of tartar, carb. soda, and 1oz. magnesia, ½lb. lemon-flavoured icing sugar. Mix thoroughly together. *Apple Beer.*—A splendid summer drink. 18 tart apples (large), 4galls. water, 5 cups sugar, 1 cup raisins, 2 cups hop yeast, 1 finely shredded lemon or 1 teaspoon essence. Boil water, sugar, and raisins, finely shredded apples, and lemon. (Do not peel or core apples.) Remove from fire at once, and stir occasionally until cool; then add yeast, stand 12 hours, then strain and bottle. Tie down corks, and put in a cool place. *Cold Water Ginger Beer.*—2lbs. sugar, 2galls. cold water, 2 tablespoons each cream of tartar and ginger, 1 teaspoon essence of lemon, 1 small cup of yeast. Stir all well together, and stand over night. Strain and bottle. Ready for use in two or three days. *Hop Beer.*—4galls. water, 1 handful hops, ½ cup horehound, 4lbs. sugar, 1 tablespoon each treacle and ginger, 1 handful bran. Boil until hops stop floating, stand to cool, then add 1 cupful of good yeast. Strain, let stand for about 12 hours, then bottle.

CHRISTMAS COOKING.

Miss R. Blumson, of the Laura Bay Branch, read the following paper:—

The cake should be made 2 or 3 months before Christmas. Special attention must be paid to the heat of the oven as the cake is more difficult to bake than to actually make. The oven must be hot when the cake is put in, and reduced after 15 minutes, and then cooked in a moderate to slow oven. The oven is responsible for the many failures beginners often experience. As making the Christmas cakes is a long job, have everything prepared the day before. Great care should be taken to read the recipes through thoroughly as one item left out may spoil the cake. Tins must be greased and covered with 3 or 4 thicknesses of paper. The papers around the sides of the tins must not be too high, or sufficient heat will not pass over the top of the cake, thus causing it to drop in the centre. Self raising flour should not be used, as it contains too much rising, and also makes the cake rise unevenly. Use plain flour and 1 teaspoon carb. soda to 1¼lbs. flour. The quantity of fruit and eggs makes the use of cream of tartar unnecessary. Always have the fire burning a few hours before the cake is put into the oven in order to have an even heat. Use a wooden spoon for mixing. Sometimes the cake mixture curdles when adding the eggs; to overcome this, beat quickly, and it will generally become smooth again; if it does not, add a spoonful of sifted flour. The fruit (which must be rolled in flour) should not be put in the cake damp or it will all sink to the bottom. Salt or bran sprinkled on the bottom will prevent it from burning. The cakes should bake from 2 to 5 hours according to size. They must then be wrapped in grease-proof paper and kept in an airtight tin. The almond icing (or paste) must be made quite stiff so that it can be rolled without sticking to the rolling pin or paste board. When rolled out thin, place over top of cake and trim off evenly. Then roll more out for the sides.

Recipe for the Almond Icing.—½lb. ground almonds (almond meal), 12ozs. icing sugar (or 6ozs. each of icing and castor sugar); mix with the white of an egg and lemon juice. A dessertspoon of brandy is sometimes used, but lemon juice gives the icing a nice flavour. Orange flower water can be added if liked (but can easily be omitted if not on hand). After trimming the almond icing off evenly, leave to dry before going on with royal icing. Recipe—8ozs. icing sugar, white of 1 egg, few drops of acetic acid or lemon juice, few drops blue colouring. Beat well until stiff enough to stand in points if lifted from the spoon. Use a flat knife dipped in hot water to smooth it with. Ice the cake 4 or 5 days before intended for use. A little glucose (or maize syrup) improves white icing and prevents it from becoming hard and brittle. Use glucose in the proportion of 1 dessertspoon to 1lb. icing sugar. There are numerous decorations on the market. Piping needs practice, but looks very effective. If an icing set is not available, cut a hole in the corner of a clean paper bag and use that as a forcing bag.

Christmas Pound Cake.—1¼lbs. plain flour, ½ grated nutmeg, ¼ teaspoon salt, 1 teaspoon cinnamon, 1½ teaspoons spice, 8 eggs, 1lb. butter, 1 lb. sugar, 1½lbs. sultanas, ¾lb. raisins, ¼lb. currants, ¼lb. dates, ¼lb. candied peel, 1 dessertspoon treacle, small teaspoon carb. soda stirred in a little boiling water, 2 tablespoons blanched almonds, a little rum or brandy if desired.

Christmas Cake.—1lb. each sugar, currants, raisins, butter, lemon peel, plain flour; 6 dried figs, 1 nutmeg, 9 eggs, ½lb. almonds cut finely, little essence lemon, a little mace, 1oz. preserved ginger.

Rich Christmas Cake.—1¼lbs. plain flour, 1lb. each butter, brown sugar, sultanas, raisins, currants, ½lb. each mixed peel, almonds (blanched), preserved ginger, figs, ¼lb. crystallised cherries, 8 eggs, 1 gill brandy, ½ grated nutmeg, 1 teaspoon mixed spice, 1 teaspoon cinnamon, 1 teaspoon carb. soda, ½ teaspoon salt, a little caramel.

Method for Above Cakes.—Cream butter and sugar, add eggs 1 at a time and beat well, add flour and fruit alternately, mixing all thoroughly. Spices, &c., should be sifted in with the flour, and lastly, soda added in a little boiling water.

Puddings.—These may be either steamed in a basin or boiled in a cloth, with the former, the pudding is much lighter and also a better shape. The water must be kept boiling and more water added when necessary while cooking the pudding.

Christmas Pudding.—1½lbs. bread crumbs, ½lb. flour, 1lb. finely shredded suet or butter, ½lb. sugar, 1lb. currants, ½lb. raisins, ½lb. candied peel, 1 nutmeg, 1 packet mixed spice, ¼lb. chopped almonds, 8 eggs. If suet is used, all the dry ingredients should be mixed together and the eggs (well beaten) added last. If using butter, cream the butter and sugar as for a cake, then add beaten eggs and dry ingredients by degrees. Cook in a cloth or basin. Cook from 4 to 6 hours.

Christmas Plum Pudding.—½lb. butter, ¾lb. raisins, 4ozs. mixed peel, 1lb. dark sugar, 1lb. sultanas, 7ozs. breadcrumbs, 5ozs. flour, 2½ozs. almonds (chopped finely), ½ nutmeg (grated), 1 teaspoon each ginger, cinnamon, and allspice, 1 teaspoon salt, 1 teaspoon baking powder, 4 eggs, ½ cup milk. Beat butter and sugar to a cream, add eggs one at a time, and dry ingredients. Steam for 7 hours, or if put in 2 basins, 4 hours each.

Hard Times Christmas Pudding.—1 cup flour, ¼ cup treacle, 2ozs. each suet (or bare tablespoon butter), currants, sultanas, 2 or 3 tablespoons milk, ½ teaspoon carb. soda. Rub suet (or butter) into dry ingredients. Warm treacle and add milk, then mix all together. Pour into well greased basin and steam for 2½ hours.

Good Christmas Pudding.—1lb. each currants, raisins, butter, breadcrumbs, 8 eggs, 1 handful flour (plain), 2 tablespoons brown sugar, 1 dessertspoon treacle, 1doz. minced almonds, ½lb. lemon peel, 25 prunes (cut up), ½ teaspoon carb. soda, 1 wineglass rum or brandy. Mix all dry ingredients. Beat butter to a cream then beat yolks in 1 at a time. Beat white stiff and add to butter and yolks, then mix into dry ingredients, stir well and lastly add brandy. Add soda last in a little milk. Soda darkens and also makes the pudding much lighter.

Plain Christmas Pudding.—1 cup each suet, breadcrumbs, flour, raisins, currants, sugar, milk, 1 teaspoon carb. soda, little lemon peel. Mix suet into flour, add sugar, fruit, and breadcrumbs, and mix with milk. Boil for 2½ to 3 hours in a cloth. The above puddings can be served with whatever sauce desired. Although brandy sauce is considered the correct sauce for Christmas puddings, cornflour, arrowroot, or custard sauce is quite nice.

Brandy Sauce.—¾ pint water, 2 tablespoons sugar, ¼ pint brandy, 1½ dessertspoons arrowroot (blended in a little water), little brown colouring if liked. Boil water, add sugar and arrowroot. Stir until it thickens. Remove from the fire and add brandy. Do not make until the last minute (nor let it boil after brandy is added) as reheating causes brandy to lose its flavour.

English Christmas Mincemeat.—1½lbs, raisins, 1lb. currants, 1lb. sultanas, ½lb. lemon peel, 1½lbs. apples (after being cored and peeled), ½ packet mixed spice, 1 teaspoon salt, 1 grated nutmeg, ¾lbs. suet (or 10ozs. butter, melted), 1 lb. sugar, ¼ pint brandy. Chop all above ingredients separately and mix well together. Mix in a large basin, add ½ pint cooking brandy. Paste down in jars. Make it 2 or 3 months before use if possible.

[By Mrs. A. Andrews, Snowtown.]

Much forethought and preparation are involved in making the arrangements for the smooth running of Christmas menus. With possible heatwaves and a last minute rush to finish the reaping, &c., one is left with little time to spare immediately before Christmas Day, so that it is well to take advantage of any cool days to get the cakes and puddings made.

In suggesting a Christmas menu, and in dealing with the necessary preparation, it is proposed to deal only with plain, ordinary fare, and although some may wish to make more elaborate preparations, this list does not involve more labour than the one woman-power household can manage.

The suggested menu is as follows:—

Dinner, Hot.—
    Roast poultry (turkey, goose, duck, or fowl, as preferred, with seasoning).
    Baked ham.
    Vegetables—Greens, French beans, or green peas; new potatoes.
    Giblet gravy.
    Pudding—Plum, with sauce.
Tea.—
    Cold meat.
    Salads, pickles, &c.
    Custard, jelly, stewed fruit, or trifle.
    Christmas cake.
    Various other cakes, biscuits, &c., as preferred.

In addition to this list, have a supply of tinned meats and preserved fruits on hand in case the weather is hot or for the hastily arranged picnic.

Christmas Cake,—This may be made a month to three weeks before Christmas and stored in an airtight tin until the day before, when it should be iced. Prepare the fruit the day before the cake is to be mixed. Having this weighed and prepared, making and baking the cake is quite a simple task. *Recipe*:—Beat 1lb. butter to a cream with 1lb. sugar, add 10 eggs 1 at a time, 3 dessertspoons treacle, 1 teaspoon carb. soda, 4 to 4½ cups flour. Add fruit floured with half the flour, 1lb. each sultanas, currants, raisins, dates, ¼lb. almonds (blanched and chopped), ½lb. lemon peel. To other half of flour add 1 nutmeg (grated), ½ teaspoon ground cloves, 1 teaspoon cinnamon. Enough for 2 large cakes. Bake in moderate oven for 3 hours.

The Pudding.—The pudding may also be made weeks beforehand and boiled again on Christmas Day. *Recipe*:—1lb. currants, 1lb. raisins, ¼lb. lemon peel, ¼lb. almonds (blanched and cut up), ½ packet mixed spice, 1 teaspoon ground ginger, 1lb. each sugar, suet, plain flour, ¼lb. breadcrumbs, ½ teaspoon carb. soda in one tablespoon hot water, 8 eggs, 1 tablespoon brandy. Make into 4 puddings and boil for 6 hours. Hang in a dry place until required. Boil for 2 hours on Christmas Day. *Sauce*—Boil 1qt. milk, sweetened to taste; thicken with cornflour; serve cold.

Poultry.—This should be in hand a day or two before Christmas Day, and the bird selected—preferably a young male of plump appearance—should be plucked and drawn the day before and hung in a cool place. The bird should be stuffed, spread with dripping, and placed in a hot oven, frequently basted, and baked for 2 to 3 hours, according to size. The giblets may be boiled and the stock used for making the gravy. The seasoning may be placed in the bird or steamed separately in a basin. Some prefer to do it the latter way in hot weather if the bird to be cooked will not all be eaten on Christmas Day. *Recipe:*—2 cups breadcrumbs, 1 onion (grated), 1 tablespoon dripping, thyme, pepper, and salt to taste. Bind with beaten egg. Use sage for duck or goose.

The Ham.—The Christmas ham is a great standby in hot weather. A little served with the poultry for Christmas dinner adds to the attractiveness of that meal, or if, as is preferred by some, the Christmas dinner is a cold one, the ham plays an important part in the menu.

The ham should be soaked for several hours before it is cooked. Trim off all unsightly parts. Put it in a preserving pan with a lid in lukewarm water and bring to boil. Allow to simmer gently until done. Leave in water until cool. Remove the rind, place in meat dish, sprinkle with breadcrumbs, nutmeg, and cinnamon, and stick cloves in the fat. Pour over a pint of the liquid in which it was boiled and bake for ¾ hour in hot oven, or until nicely browned. This baking greatly improves the flavour of the ham. Time to boil ham—about 2 hours.

Salads.—Salads to serve with cold meat must be absolutely fresh to be appetising, although the following may be prepared the previous day.

Beetroot in Jelly.—Boil some tender beets, cut in slices when cold. Dissolve 1 tablespoon of powdered gelatine in ½ cup of vinegar. Add enough warm water to make a pint of liquid. Pour this, seasoned to taste, over beetroot and put in a cool place to set.

Mayonnaise for Lettuce Salad.—Mash the yolk of a hard-boiled egg with 2 tablespoons sugar, 1 teaspoon of mustard, ½ teaspoon salt, ¼ teaspoon pepper. Moisten with vinegar and work into smooth paste. Add a small cup cream and blend well. Garnish top of salad with sliced egg-white. Pour mayonnaise over the top.

Homestead Meeting, Snowtown Women's Agricultural Bureau.

FANCY WORK.

[Paper read by Miss T. Barnett (Laura Bay Branch), at Conference at Ceduna, on 4th July, 1935.]

"Fancy work is an art as well as a very pleasing pastime, especially for long winter evenings. Before commencing a piece of work it is well to consider the purpose and use to which the finished article is to be put. Quite a lot of good work is spoilt and time wasted by working unsuitable materials and inappropriate designs. If the article to be worked is to be in constant use and likely to receive hard wear, the foundation material chosen should be of firm durable texture and the working thread a good quality silk; and if it is to be frequently laundered, fast colours should be specially selected. Conventional designs are more easily treated than natural ones, as they can be worked in any colouring to match the general scheme of the room of which the article is to form a part. If floral designs are preferred, be sure to work them near as possible to the natural colouring, otherwise the appearance of the article is spoilt. In working the poppy and flowers with similar petals, remember to keep a wavy outline, as every change in the direction of stitches means variety of tone, if not a tint. The direction of stitches for the flowers is towards centre, but should follow almost invisibly the outline of the flower. When the petals are deeply cupped, which is frequently the case, the direction of the stitches is not entirely towards the centre, but is given by a series of long and short stitches, so placed as to overlay one another at the base. For conventional designs, plain satin stitches, straight and slanting, may be used with good effect. When working stems or any curved lines the stitches must be much closer on the inner side of the curve than the outer. Care must be taken that the darkest shades are placed where designs are heaviest, otherwise the design is likely to appear top heavy. This rule is most essential when working sprays of flowers, as full-bloom flowers are always higher in tone than the buds. Fineness is a very strong point in fancy work, and must be done as neatly on the back as on the front. Knots must not be used; when finishing off run the thread along underneath the stitches at the back of the work.''

QUESTION BOX.

At the meeting of Belalie Branch on 13th August, 1935, a paper ''Citrus Fruits and Their Uses,'' was read by Mrs. Dave Brooks. Miss Houghton gave an illustrated address dealing with New Zealand. Answers to the Question Box were as follows:—*For Frost-bitten Knees.*—Use olive oil rubbed in; wear old stockings; rub in good skin cream. *Trees and Shrubs that will do well on Bore Water.*—Acacia, Aloysia, Scarlet Veronica, Diosma, Eucalyptus, Fabianna, Genista (Brooms), Laurustinus, Oleander, *Schinus molle* (Pepper Tree), *Salix* (Willow), Tamarix, Tecoma, Tagasaste (Tree Lucerne), Veronica. *How Moist should a Rich Fruit Cake be before Baking.*—So that the mixing spoon will stand up in it. *To Dry Woollens.*—Spread on a flat surface in the shade in open air. Pad sleeves and bodice with tissue paper. When nearly dry turn to other side. *How to Remove White Golf Ball Paint from Fingers.*—Use ''Solvol,'' eucalyptus, or kerosene. *Cold Cream.*—Melt white beeswax with liquid paraffin. Dissolve borax in warm water, and while warm mix with melted wax. Set aside 24 hours. Add perfume and mix. *Food Value of Wholemeal.*—Varies in different varieties of wheat. Nabawa contains 7.1 per cent. to 8.6 per cent. gluten, 7.4 per cent. to 8.8 per cent. protein. The lowest in these yielded 73.2 per cent. flour, and the highest 71.8 per cent. flour. This is probably due to the soil and to climatic conditions under which the wheat was grown. *Most Hygienic Filling for Pillows.*—Feathers, because they can be washed. *Best Feed for Young Turkeys.*—Hard-boiled eggs chopped with lettuce, onions (green), spinach, stinging nettles, or any greens. *To Keep Paint Brushes Soft.*—After using wash in warm soapy water and dry in open air. (Secretary, Mrs. E. L. Orchard.)

A FEW KITCHEN HINTS.

[Supplied by Mrs. A. J. Bowell, Laura Bay.]

1. It is a good plan when baking fruit cakes to put an asbestos mat under each cake to keep them from getting burnt underneath.

2. Rub off grease spots on your stove and kettles with newspaper.

3. Keep a lemon in your kitchen. It will be very handy for taking stains from the fingers after peeling fruit and vegetables.

4. Keep an old catalogue on your kitchen table for standing hot pots of any sort. It saves the oilcloth; just tear off the dirty page and burn it and you still have a clean book and table.

5. For brown marks on teacups, rub on a little Dutch cleanser, or some ashes and marks will come off quite easily.

6. When you are about to clean your stove with blacklead, first dust your hands with flour, rubbing it well into the knuckles and fingers, then get a paper bag, and put your hand into it to hold the blacklead brush handle. Use a bag for each brush and you will find that your hands will be quite easy to clean afterwards.

7. You can keep your teatowels and dishcloths a good colour if you keep your aluminium saucepans off the open fire. Put them on the stove in plenty of time to get

hot, otherwise put in boiling water from the kettle if you want it to boil quickly. If you put them on the open fire grease the bottom of the saucepan first, then, before you wash it, rub off the black with some newspaper. (Secretary, Miss T. E. Barnett.)

PICKLES, SOUR AND SWEET.

The following paper was read by Mrs. W. W. Bowell at a meeting of Laura Bay Branch on 13th August:—"There is a great variety of pickles, each country have their own particular fancy. Australians, Indians, and Americans use pickles, sauces, and chutneys more than most other countries. The hot climates seem to give people a taste for them, because cold meats are used more, and need something tasty to help people's appetites in hot weather. The Indian mango pickles and chutney are very nice and appetising; some are mild, but most are very hot. Pickles are made from almost all kinds of vegetables and fruit. Tomatoes are one of the most useful fruits, and mixed with melon and onions, or marrows, or any other vegetable, either in clear vinegar or a mustard mixture and with various spices and flavourings, make many kinds of pickles. Melon and marrows are useful to give body to pickles, and these vegetables absorb other flavours, making a little go a long way when certain kinds are scarce. Figs make the best pickles. Grapes, pears, quinces, plums, peaches, apples, mangoes, cucumber, and cauliflower all mix well with melon and onions. Red cabbage and walnuts are also good. Chutneys are more of a mixture of fruits than pickles, with the addition of raisins, red and green peppers, rhubarb, currants and sultanas, ginger and garlic. Chutney is usually rather sweet and hot, and can be varied according to taste. One recipe is:—Take a bottle of piccalilli and mince, add a tin of plum jam and boil. There you have an easily made chutney. There are so many ways of making pickles that it is hard to choose recipes. *Fig Pickle.*—Cover as many half-ripe figs as you want with vinegar and soak three days. Then pour off and boil vinegar with 1lb. sugar to a quart of vinegar, and 2ozs. salt, 1oz. of allspice, 1oz. cloves, 1oz. whole ginger, and a few peppercorns. Boil 10 minutes, then pour over the figs while hot and cover when cold. Ready in three weeks. *Mustard Pickles.*—Cut up 3lbs. of tomatoes and 3lbs. onions. Cover with a brine over night. Put on and just bring to the boil and strain. Mix 1½ to 2 cups sugar, ½cup flour, 6 tablespoons mustard, 1 tablespoon turmeric, 1 teaspoon pepper and salt to taste with some of the 2 qts. of vinegar. Put the remainder of vinegar on to boil, stir in the above mixture and just bring to boil again. Any other mixture of vegetables can be used.

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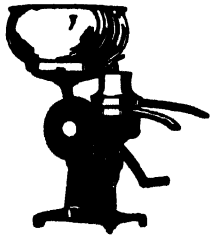

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DRESSMAKING.

[Paper read by Miss M. MILLER at a meeting of the Balhannah Branch on 17th July.]

The subject of clothing claims the attention and interest of all women—some more than others. Let us divide these women into three groups.

Group I.—The women who have a natural gift for designing and constructing clothing artistically; also women who have acquired this ability would come under this heading. If these women are given material, scissors, tape measure, pins, etc., they, through natural ability, or carefully though-out design, will turn out a first class garment.

Group II.—Women who cannot design yet have ability to construct.

Group III.—Consists of those who know little or nothing of designing or construction. These last two groups form the vast majority, and are wonderfully catered for by the pattern of to-day.

It is most important that the home dressmaker should know how to take measurements thoroughly, and accurately. Not knowing the correct way often results in the waste of good material, therefore, every care should be taken.

Tie a tape rather tightly round the natural waist line—this is a guide for other measurements taken to and from the waist.

1. **Neck:** this measurement is taken firmly.
2. **Bust:** measure loosely—a good idea is to pin the tape measure well up on the shoulder blades, then bring loosely round the fullest part of bust.
3. **Across** the chest, between the armhole—about four inches below the throat.
4. **Length** of front: taken from the two little bones at base of throat to the waist.
5. **Length** of shoulder.
6. **From** front waist to shoulder and then over to back waist.
7. **Under** the arm: from well up in the armpit to the waist.
8. **Back:** taken from nape of the neck to waist line.
9. **Width** across the shoulder blades is taken at the widest part of the back.

Sleeve—

10. Armhole: This is taken with arm hanging loosely at side, round top of armhole over the point of the shoulder blade.
11. Front seam of sleeve—taken from the front of arm pit to wrist with arm straight.
12. Outside measurement of sleeve—measure from top of arm hole to elbow (arm bent) to wrist.
13. Around upper arm—an easy measure.
14. Round elbow—firmly—arm bent taken over point of elbow.
15. Wrist—firm.

Skirt—

16. Waist—taken firmly round waist line.
17. Hip measurement is taken loosely about 6in. below waist line—also a good idea to sit on tape and take that measurement.
18. Front length—taken from waist to floor.
19. Side length—waist to floor.
20. Back length—waist to floor.

For the required length of skirt, deduct the number of inches to desired length from floor. Other measurements may be taken, such as from shoulder to required length, etc.

Drafting—There are different methods. If one can have a term or so learning drafting, designing, and pattern cutting, dressmaking is simplified—if unable to do so, any good dressmaking teacher will cut out and fit you with a foundation calico pattern from which any frock can be designed, and, of course, bought paper patterns may be placed on this foundation pattern, and cut to your measurement.

There are many reliable paper patterns to be bought—Weldons, McCall, Butterick, and others. Often these patterns need very little alterations; they may be tested by your measuremens, but the safest way for an inexperienced worker to follow is to pin the parts of the pattern together, slip it on, and note what corrections seem necessary—some workers get good results by simply holding pieces up against the figure, but this is not as safe a way as trying the pattern on, which, if carefully done, will not tear the pattern.

When altering patterns one should remember that the outline, as carried out by the designer, should not be altered in any way—work from the inside.

When pattern has been altered to fit the individual measurements the material is prepared for cutting out. Examine pattern or design of cloth. Floral designs may run in one direction. Plaids may have an up and down—stripes may have a right and left, because of the arrangement of stripe and so have to be cut one way. Always be most careful when placing patterns on velvet to have them all the same way, and to have the pile running from the bottom upwards.

Careful cutting out makes so much difference to the look of a finished garment, that this first process should never be hurried.

Arrange all the pieces of pattern on material before cutting—avoid raising when cutting out by lightly resting left hand on material.

A little extra time and patience spent in pattern marking will save a great deal of time when fitting later on. A tracing wheel may be used on thin materials though tailors tacking is better (for this use tacking cotton). Tailor's chalk may be used on some of the thicker materials. It is wise to mark all lines of pattern. Pin seams together and tack before machining.

Seams.—The most popular and simplest seam is a single or flat seam made by joining two pieces of material together, right sides facing. This seam sets well. Except when seam comes under lining it should be neatened off. By neatening off, I mean, notching, overcasting, or turning in and machining and then pressing flat. For curved seams notching is essential. This flat seam is always used on tailored clothes.

After the flat seam, the seam most used is French seam, *i.e.*, a seam within a seam. This is a neat way of stitching silks and should be narrow in width—about ¼in.—allow for proper setting.

The fitting of a frock is very important. Sleeves often worry—never cut two sleeves for one armhole. If the sleeve hangs in wrinkles in the front, the back of the sleeve has been set too far to the front and needs resetting more toward the back and if the wrinkles are in the back, *vice versa.* The grain of the material should run straight from top of sleeve to elbow.

A good idea when fitting and turning up the hem is to cut a strip of cardboard and notch one side the number of inches from one end that the skirt is to be from the ground (stand on table). Get your helper to move notched cardboard round bottom of skirt putting in pins parallel with notch—then the hem can be turned at pin line.

False hem can be cut either to shape of skirt or with crossway strips. Invisible hemming is used on tailored skirts and dresses; take up just one or two threads, then insert needle into turned hem, pass along about ¼in. before bringing out in the usual way.

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The tailored hem is made with binding machined on to edge of hem and then invisibly stitched.

Shoulder picks or pleats should not run with thread of material but with sleeve line.

Bias loops are used for an even closing, mostly for neck and sleeve openings. Make a bias fold and press flat. Tack in loops to fit buttons on turned edge, stitch down, and bring fold over the rough edges. Hem flatly and press.

Hemstitching and faggotting lend a very effective finish and decoration to a frock.

To allow fullness in front for tucks split pattern and spread apart.

For flares it is necessary to cut a foundation paper pattern and cut up from the bottom 2in. or 3in. apart, and spread out on material. (Secretary, Miss D. Spoehr.)

INEXPENSIVE CHRISTMAS GIFTS.

The following paper was read by Miss H. Telfer at the November meeting of the Warcowie Branch:—

A Christmas gift can be enhanced with very little trouble and expense and made a delight to the eye. In the first place a gift sent in a box is far more attractive than an untidy parcel. Coloured tissue paper costs little and gives a very festive look to parcels. White string can be dyed various colours or dipped in red ink, and is more attractive than ordinary coloured string. Narrow ribbons are also inexpensive. A box of hankies tied with lavender ribbon with a sprig of dried lavender in the ribbon will have an added charm. A wrap of white tissue paper can be used with scarlet ribbon for the tying and add a sprig of holly at the bow. Another wrap can be made by tying the article first wrapped in pale-blue tissue and with rose-coloured ribbon and a rose cut from wall paper or from a seed catalogue and pasted on the lid of the box. Round boxes such as those used for face powder are very dainty done up in a large circle of tissue paper which is gathered up to the top and tied, and the edges fringed. It has the appearance of a large chrysanthemum, and the paper may be cut in points. Coloured pictures cut from magazines, &c., and pasted on the outside of parcels also add to their appearance. A charming exterior makes a pleasant impression on the recipient of the gift.

SUITABLE GIFTS.

Evening Dress Hanger.—No modern wardrobe is tall enough to hang long evening frocks in. All that is needed are two cheap wooden coat hangers, about 2½yds. of narrow ribbon, and some scraps of silk of coloured dress material. Take the hanger part off one coat hanger and pad both hangers first with some wadding or rag, then cover with material or silk. Take the one with the hanger part still attached and fix a piece of ribbon about 15in. long to each end of it, about 2in. from the end. The second hanger has a piece of ribbon 2ft. long attached in the same position as the first. Make a loop at the other end of both hangers. This loop is then slipped over the end of the first hanger, and the ribbons on the first hanger tied in a pretty bow to keep them in place. To hang a dress on it, remove the bottom hanger, hang the dress upon the top by the shoulders, fix the bottom hanger on again, and lift the skirt part and hang carefully over the suspended hanger. A few artificial flowers added to the centre of the upper hanger gives a finishing touch to this article.

Shoe Cleaning Pads.—Even though shoes are cleaned just before leaving home, by the time a short distance has been walked outside, the shoes are covered in dust. A pad that can be kept in the handbag is a novel idea, and is very easily made. A piece of oilcloth, poplin, or canvas, or any firm material about 4in. by 6in. is required. Line it with a soft material and then cut up a piece of velvet three-quarters of the length of the oilcloth. Turn in one end, place the oilcloth and the first piece of lining on the wrong side of the oilcloth and the second piece on top of that. Sew all raw edges together and bind all around. Roll into a little bundle or fold like an envelope. Shape and fasten with a press stud.

Traveller's Coat Hanger.—These are very useful when going on a holiday and take up very little space. All that is necessary is a piece of ribbon about 20in. long and two small pieces of elastic for the circles about 3in. long. Sew elastic into the circles and cover with ribbon, then allow 11in. for the loop in the centre to hang it up by. A newspaper rolled up tightly and put in these circles and bent the shape of the shoulders completes the hanger.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Angaston, Saturday, February 29th, 1936.
Mundalla, Wednesday, March 4th, 1936.
Mount Pleasant, Thursday, March 19th, 1936.

Agricultural Bureau Conferences, 1936.

River Murray (Swamps), at Wood's Point, Thursday, 20th February (Mr. F. P. Baily, The Point, Secretary).

Lower North, at Owen, Thursday, 27th February (Mr. A. Helps, Owen, Secretary).

Yorke Peninsula, at Arthurton, Wednesday, 4th March (Mr. T. H. Howlett, Box 8, Moonta, Secretary).

Mid North, at Beetaloo Valley, Thursday, 12th March (Mr. B. W. Giddings, Beetaloo Valley, Secretary).

South East (Lower), at Kybybolite, Wednesday, 8th April (Mr. A. S. Shepherd, Kybybolite, Secretary).

Dairying, at Strathalbyn, Thursday, 21st April (Mr. Reg. Sissons, Strathalbyn, Secretary).

River Murray, at Block E, Thursday, 18th June (Mr. J. C. K. Brigham, Box 65, Renmark, Secretary).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Rebate in Rail Carriage of Sheep.

In order to encourage the movement of sheep from the Northern areas to the South-Eastern portion of the State, the Railways Commissioner has approved of the payment of a substantial rebate on rail carriage of sheep from and to the area mentioned. The rebate which will be granted is 40 per cent. (40 per cent.) of the full van rates, made up of—

25 per cent. rebate for store stock.
15 per cent. rebate in return for the dispatch of wool from the South-East to Port Adelaide by rail transport during the next shearing after movement of sheep.

The rebate will be paid on sheep forwarded to *bona fide* graziers at Bordertown, or any station in South Australia situated South, or South-East thereof *from* any railway station within the following area:—

All stations from Burra to Quorn, inclusive.
All stations from Crystal Brook to Cockburn, inclusive.
All stations from Gladstone to Wilmington, inclusive.
All stations from Mount Mary to Morgan, inclusive.
All stations from Renmark to Barmera, inclusive.
All stations from Lameroo to Pinnaroo, inclusive.

This rebate will apply to consignments of *not less than* ten (10) four-wheeled vans of sheep consigned from the areas named above.

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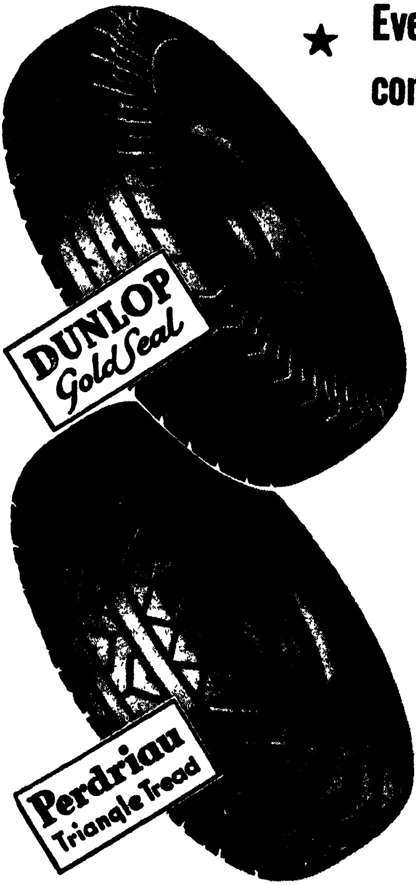

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Crops for a Ti-tree Swamp.

After examining the soil taken from a swamp in the Edillilie district on which grows Cutting Grass, Black Broom, &c., Mr. W. J. Spafford (Deputy Director of Agriculture) has advised a correspondent who asked what would be the best crops to grow on this type of soil that he would be likely to experience some trouble in getting good pastures established on and near the swamp, and before much expense is incurred a few trial plots should be put down.

Plough the land deeply in early winter and work it thoroughly to mix the concentrated salts now at the surface into a greater body of soil. On one plot sow King Island Melilot at the rate of 6lbs. per acre, with superphosphate at the rate of 2cwts. per acre. On another plot sow Wimmera Rye Grass at the rate of 8lbs. per acre, with superphosphate at the rate of 2cwts. per acre. On another plot plant roots of the Giant Reed (commonly known as Bamboo and grown in most people's gardens as such). The Giant Reed shoots, up to 6ft. in height, are equal to green barley in feeding value, and are relished by all farm livestock. This plant will grow in very salty locations and is not used as often as it should be as a fodder plant.

If the land is as salty as the sample indicated, there is nothing really useful other than the three plants suggested (unless it be Saltbush), which is worth trying, but if it is not so very saline then Barley is the cereal to try. To try Barley, plough deeply, work the land thoroughly during the winter, and then at the end of July, or even in the beginning of August, sow Barley at the rate of 50lbs. seed and 1cwt. superphosphate per acre.

On the better land of the Edillilie district Dwalganup Subterranean Clover should do quite well, provided that it receives about 1½cwts. of superphosphate per acre per year. To establish this clover in a crop, use about 4lbs. of seed per acre, and on no account fire-rake the stubble, and be careful not to overgraze the clover after the crop is harvested. If it is essential to fire-rake the stubble to kill shoots, the land is not ready to put into pasture.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publications:—

"The Rabbit in Australia," by David G. Stead.

VETERINARY INQUIRIES.

[Replies supplied by veterinary officers of the Stock and Brands Department.]

Via *Ballarat, Victoria, asks for drench for worms in sheep.*

Reply—The following mixture is recommended:—Copper sulphate, 1lb.; black leaf 40, 14 fluid ozs.; water, 6galls. To prepare—make the solution of copper sulphate first, then mix into it the requisite amount of black leaf 40. Doses—Adult sheep, 2 fluid ozs.; two-tooths, 1½ fluid ozs., &c. This combined drench is giving excellent results, and appears to be more effective than the drench of copper sulphate by itself.

"Kimba" reports draught mare with swelling on inside of leg near the tendon. Horse has been lame for six months.

Reply—Owing to the length of time that the animal has been affected without receiving appropriate treatment, it is very doubtful if she will ever become sound enough again to perform work though, of course, she may have a value for breeding purposes.

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GOODYEAR

FARM IMPLEMENT TYRES

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The only treatment that could be tried would be to clip the hair short over the swelling. Then after bathing the skin with warm water containing a little vinegar, rub in all over the swelling for 15-20 minutes some red iodide of mercury blister (strength, 1 to 8—any chemist will supply this on request). The application of the blister is best done in the morning, and the animal should then be kept tied up short during the rest of the day so that she cannot bite the blistered part. The following morning wash off any remains of the blister with warm water and soap, snip with a sharp pair of clean scissors any unbroken blisters, and then anoint the blistered skin with sweet oil or lanoline, and turn the animal out for a lengthy spell. The application of the blister can be repeated in four or five weeks' time if necessary.

"Cherry Gardens" reports (1) *horse rubbing itself, and* (2) *heifer with blood in the milk of one quarter.*

Replies—(1) The cause is due to external irritation, such as presence of lice or small skin parasites, or accumulation of dirt on the skin, or might be due to the diet. Treatment: One warm day wash the animal thoroughly with soap and warm water, leaving the lather on for five minutes; then wash off thoroughly with rain water, and dry the animal by rugging or walking about. Then apply the following oily dressing:—Raw linseed oil, 1 pint; oil of creosote, 1 fluid oz.; flowers of sulphur, 4ozs. Shake well, and apply to affected parts with a body brush, and repeat at 3-4 day intervals. (2) This is not uncommon with heifers, and is due to engorgement of udder with blood, and the rupture of small blood vessels. It should clear up in from 4 to 14 days. Care should be taken when milking to handle gently.

Agricultural Bureau, Rendelsham, reports (1) *pony lame on the near hind leg for the last three weeks, and* (2) *aged draught horse stamping the ground with its hind feet.*

Reply—The animal should be exercised to see if the lameness is present at the walk or trot, also note if the pony will take full weight on the affected leg, and then carefully examine and see if any swelling is present about the stifle, hip, &c., and handle the tendon sheath and joints to discover if any heat or pain is present. An essential procedure is to examine carefully the foot by using a pair of wide-mouthed pincers and testing the foot for symptoms of tenderness when pressure is applied. The pincers should be placed at the junction of the wall and sole on the outer heel and gradually worked round to the inner heel. If any flinching is noticed, clean up the sole with a rasp, and look for evidence of a crack with an oozing of greyish or black matter, which indicates pus in the foot. If this is found it must be opened up and the foot placed in a hot antiseptic solution for 5-10 minutes and then into a hot bran poultice, repeating the operation for two to three days. When examining the foot the sole should be searched for foreign bodies, such as nails, wire, &c. If strain of tendons or a rick of one of the fetlock joints is suspected, the part should be covered with cotton wool and a fairly tight bandage, taking care to fill in the hollows on each side of the tendon sheaths in order that equal pressure is exerted. Remove and replace the bandage daily. (2) Stamping of the feet is usually indicative of irritation and is often associated with the presence of a small parasite on the skin of the legs. The following dressing should be applied with a body brush every three days, rubbing the mixture in well three or four times:—Lysol, 1 fluid oz.; raw linseed oil, 1 pint. Shake well before application.

"Cungena" reports a bull which, in fighting, broke off one of his horns, leaving a cavity into the head.

Reply—Provided there are no loose pieces of bone surrounding the cavity, the hole will close up completely if kept clean. Make two pads which would fit over the hole and keep it clean; one of them to be used one day and replaced by the second one. The pads should be soaked in the medicated oil and kept in place by tapes.

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THE 5-POWER PETROL

P588

HORTICULTURAL INQUIRIES.

[Replies supplied by A. G. STRICKLAND, M.Sc., Chief Horticultural Instructor.]

Is Cultivating During the Flowering Period Injurious to the Setting of Grapes?

This question was asked by the Koonunga Branch of the Agricultural Bureau.

Reply—There is no definite evidence that cultivation during setting is injurious, although Perold, a South African authority, recommends that varieties subject to "coulure," *i.e.*, bad setting, should not be cultivated for 2-3 weeks during flowering and setting.

He states that the soil will be kept warmer, and that berries will set better if the soil is not constantly kept loose. However important this may be, it is certain that there are other bigger influences concerned in "coulure," and should it be necessary for any reason to cultivate vines during setting, I do not consider that there is appreciable justification for deferring the operation.

Cabbage Moth.

Insect specimens submitted by the Clarendon Branch of the Agricultural Bureau were identified as the larvae of the Cabbage Moth, and the recognised method of control of this pest is to spray or dust with arsenate of lead preparations whilst plants are young.

Dusting with derris preparations—several of which are on the market—is also effective, and such treatment is to be preferred, especially in the later stages of plant development, owing to the fact that this insecticide is non-poisonous to humans.

If the specimen submitted was a representative one it is now too late to control the pest, the grubs having penetrated to the heart and beyond the reach of insecticidal dusts or sprays.

Treatment of plants from very early stages is essential for control of this pest.

Fertilizers for Potatoes.

"Scott's Bottom" Agricultural Bureau asks, "What would be the most profitable manure for potatoes? Tomato manure at the rate of 8cwts. to the acre, or 8cwts. bonedust, ½cwt. ammonia, and ½cwt. potash mixed per acre?"

Reply—In the absence of definite experimental evidence it is impossible to compare the two fertiliser dressings mentioned and, in fact, available information tends to suggest as best practice a dressing which differs from the two which have been quoted, *i.e.*, 3 to 6cwts of superphosphate plus 1cwt. of sulphate of ammonia per acre. Bonedust may be used as substitute for portion of the superphosphate if applied rather more heavily than superphosphate, but it should be noted that bone fertiliser is much slower acting than superphosphate. The latter fertiliser is able to fully benefit the crop in the season of application, but the beneficial effect of bonedust will be spread over several seasons.

So far there is little evidence that potassic fertilisers will increase yields, although there are indications that when used in the form of sulphate, quality of the potatoes is improved. The issue is not clear cut, however, and as potash is an expensive fertiliser heavy dressings could not be freely recommended. An occasional dressing of ½cwt. to 1cwt. of sulphate of potash per acre should be sufficient to ensure ample potash for production of quality crops, and until further experiments have given results it must be said that the need for potash is not marked.

Method of Applying Fertilisers.—The quick-acting fertilisers—superphosphate, sulphate of ammonia, and sulphate of potash—are best applied in the furrow at planting time. If bonedust is used with the object of long-range improvement in soil fertility this fertiliser may be applied broadcast some considerable time before planting.

Form of Potash Fertiliser.—Sulphate of potash is preferable to muriate of potash; it has been stated that whereas sulphate improves quality muriate may have the reverse effect.

Availability of Bonedust.—Bonedust is a relatively insoluble and slow-acting fertiliser, and the total amount of plant food in any quantity applied to the soil only becomes gradually available over a long period. Although some small benefit might accrue in the season of application of bonedust, the main benefits must be looked for in future seasons. For quick results always use superphosphate as a source of phosphoric acid.

FOREST MANAGEMENT.

The library of the Department of Agriculture has received from the publishers, Messrs. Chapman & Hall, 11, Henrietta Street, Covent Garden, London, W.C.2, a copy of a volume, "A Textbook on Forest Management," by M. R. K. Jerram, M.C., Assistant Lecturer in Forestry, University College of North Wales, Bangor, England. The object of the book is to bring to the notice of students all matters of primary importance relating to Forestry Management. It introduces to the student the more important problems which are involved, explains the principles on which their solutions are based and provides a framework on which a fuller knowledge may be built up. Published price, 10s. 6d. net.

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MILLING CLASSES OF SHOW WHEATS, 1935.

[By C. E. Chapman, F.I.C., F.A.C.I., Deputy Government Analyst, and A. J. Farquhar, A.A.C.I., Analyst, Department of Chemistry.]

There were 43 samples of wheat entered for competition in the milling section of the 1935 Show of the Royal Agricultural and Horticultural Society.

The Society provided prizes for wheats which were classified into six classes, as follows:—

3003. Strong Flour Wheat, White, from district with an average annual rainfall of 16 inches or over.
3004. Strong Flour Wheat, White, from district with an average annual rainfall of less than 16 inches.
3005. Medium Strong Flour Wheat, from district with an average annual rainfall of 16 inches or over.
3006. Medium Strong Flour Wheat, from district with an average annual rainfall of less than 16 inches.
3007. Weak Flour Wheat, from district with an average annual rainfall of 16 inches or over.
3008. Weak Flour Wheat, from district with an average annual rainfall of less than 16 inches.

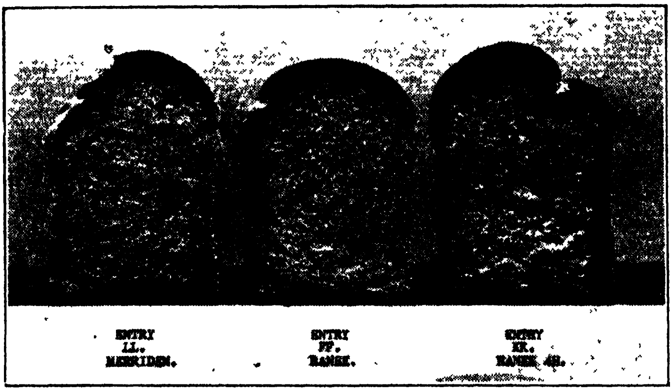
Some very interesting results were obtained from the samples, the results being dealt with under each class.

Each sample was prepared for milling by washing it with warm water and subsequently adjusting the moisture of the wheat to 15 per cent. In order to toughen the bran, a further 1 per cent. of water was added one hour prior to milling. The moisture content of the wheats when received in the laboratory varied from 12.0 to 15.1 per cent., the average being 12.8 per cent. A soft wheat, Sword (Laboratory entry R.R.), having a large number of broken grains, gave the highest result, 15.1 per cent.

The percentages of flour, bran and pollard were corrected to the same moisture basis. The chemical tests on the flour were calculated on flour containing 13.5 per cent. moisture, and the water absorption and baking tests were all carried out on a weight of flour equivalent to 85 grams of dry flour.

Class 3003.—The chemical and baking tests showed that Quality (C) was outstanding with regard to protein; it had the highest baking score and the greatest loaf volume, but the number of 2lb. loaves it would yield from a ton of flour was lower than that of the other Quality (B) (1,405 loaves). With the exception of Dundee, all the wheats of this Class must be regarded as satisfactory. The Dundee flour gave a low baking score, low loaf volume and weight, low protein, and a low water absorption for a hard wheat. It is inferior in every characteristic to the other sample of Dundee (I) in Class 3004. Taking into consideration the data made available by these tests, samples A and C were the best of this Class, although C had a lower water absorption than the majority of the samples in the Class.

Class 3004.—Entry H appeared to be the best of the Quality samples submitted, whilst the sample of Dundee was equal to the standard of this variety. All the samples of Dundee that have been tested in this Department have yielded flours of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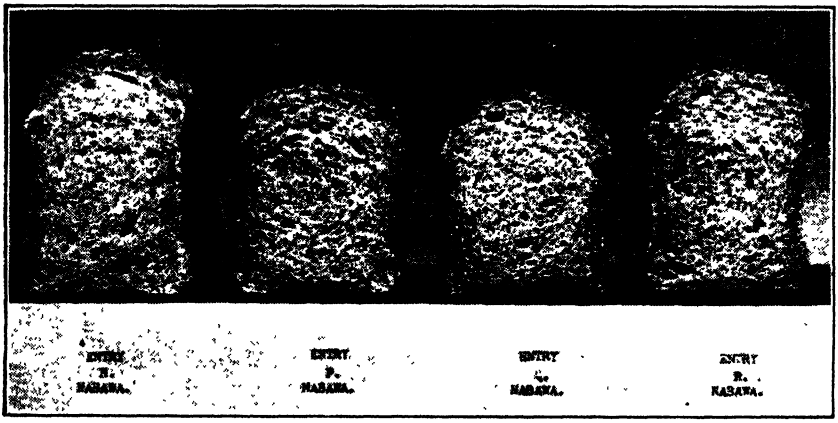
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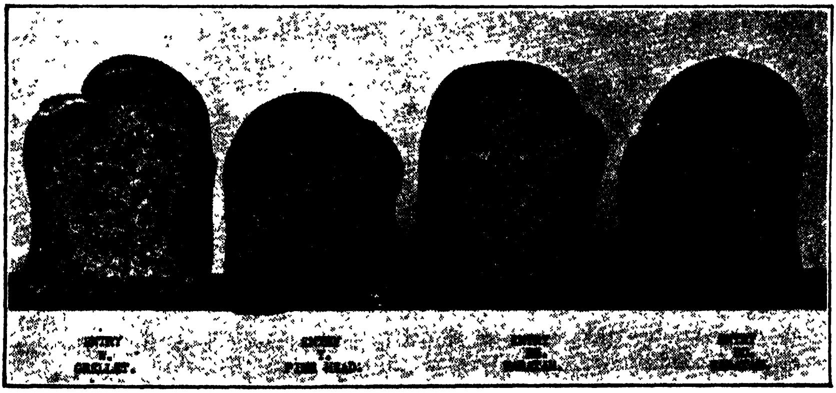

ENTRY
U.
GRELLET.
ENTRY
Y.
PIKE HEAD.
ENTRY
ENTRY

inferior colour. All the flours in Classes 3003 and 3004 with the exception of entries D and K, were superior in baking quality to those in the same Classes which were tested last year.

Class 3005.—There are only four outstanding wheats in this Class, viz., entries M, N, R, and T. M baked into an excellent loaf of bread, but had the general fault of Ford flours—low water absorption. Nabawa (N and R) were lower in protein content, but gave more loaves per ton of flour. Penn and Pine Vale entries made loaves which were shell topped, Pine Vale being very pronounced in this respect.

Class 3006.—This Class was represented by two good wheats in entries U and V, both being high in protein and of average water absorption. Gresley was in many respects similar to the best types of the Ford variety. The Ford entry was low in protein. and Nabawa (PP) had a low protein content and gave an inferior baking test. The sample of Nabawa (PP) was of very low quality, being far below the average of this variety. It is interesting to note that the Champion Wheat and this entry were both grown at Narridy.

Class 3007.—Entries X and Z were the best of these samples. Sample Sword (RR) was very dirty and contained a considerable quantity of broken grain, which explains the low yield of flour obtained. The Waratah samples both had the usual poor baking characteristics of this variety. Pine Head and Grellet were poor wheats from a baking point of view, and had very low water absorptions.

Class 3008.—Entry Sword (JJ) appeared to be the best of this Class. Following this sample, in order of merit, were Ranee (AA), Turvey (II), then Ranee (FF) and Felix (GG) equal. Although entry Waratah (HH) had 12 per cent. of protein, it was of inferior baking quality, being no better than other samples of this variety containing about 8 per cent. of protein.

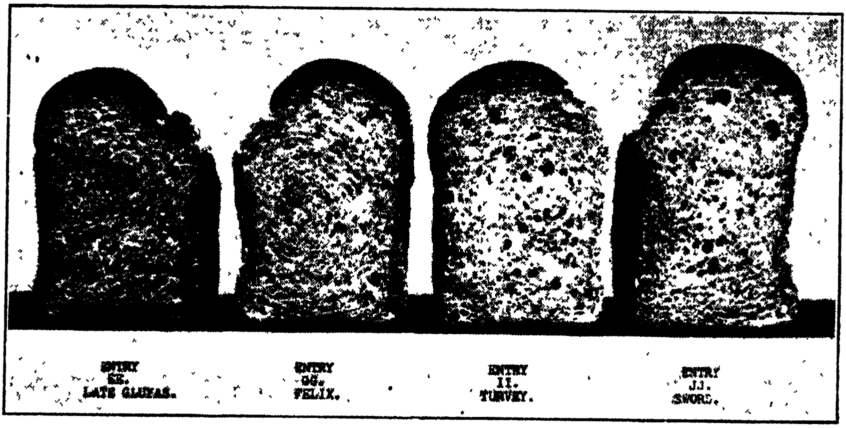
PELSHENKE AND BAKING TESTS.

It will be noted from the figures given in the table of results that the wholemeal fermentation time tests do not bear any relationship to the baking quality of the wheats. This is more noticeable in the tests made on the hard wheats.

CONCLUSION.

The milling tests and the chemical examination of the Competition wheats for the Royal Agricultural Society's Show are unquestionably of assistance in assessing the qualities of these wheats. It cannot be claimed, however, that these results are of much value in connection with the complex problem that is now receiving scientific attention by the Department of Agriculture and other institutions in order to obtain a general improvement in the quality of our F.A.Q. wheat. One must assume that the tests carried out in connection with the Show Wheats are done on the best wheats grown in the different districts of the State, and any records of the chemical tests can only be of value in making a comparison of the Show wheats of one season with those of another season.

The general improvement of the quality of wheat grown in South Australia can best be brought about by supplying farmers with improved varieties of seed wheats, which must be evolved by means of cross-breeding and careful selection, and subsequently growing these wheats in different parts of the State, in order to ascertain the varieties that are best suited to each district with its particular soil and climatic conditions.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ENTRY
GG.
FELIX.
ENTRY
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SWORD.

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QUALITY.
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QUALITY.
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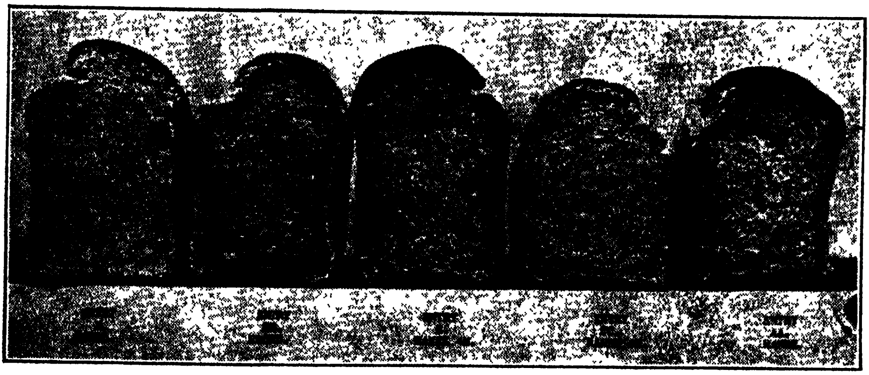

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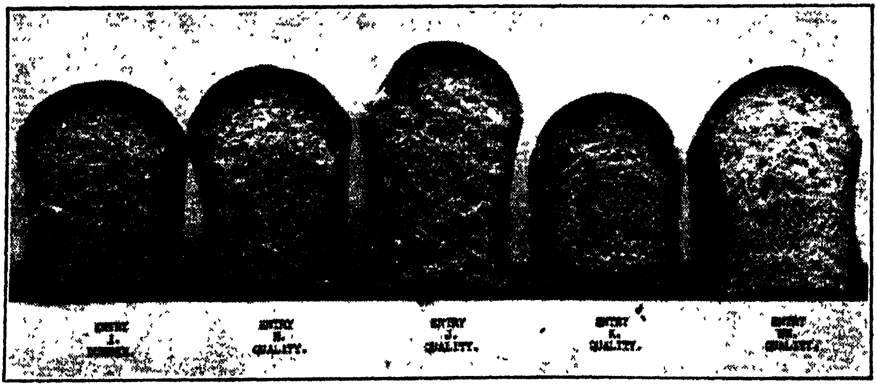
ENTRY OO. FORD.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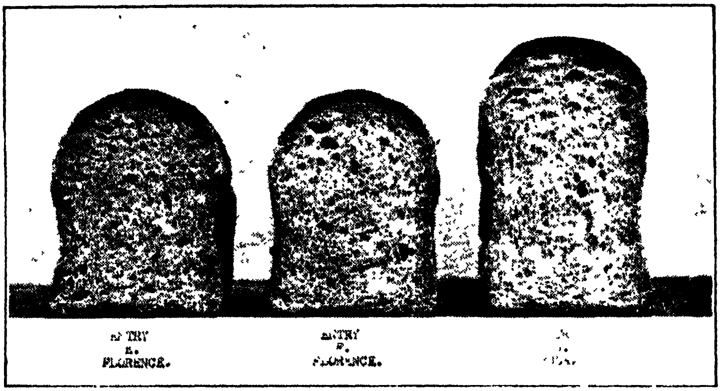
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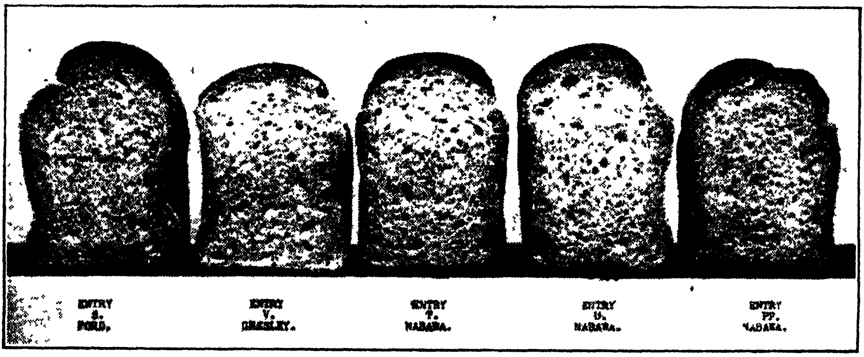
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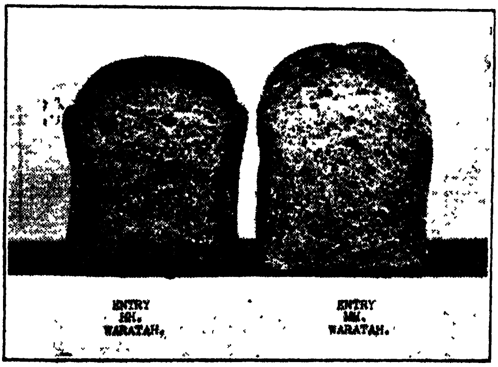

ENTRY
HH.
WARATAH.
ENTRY
MM.
WARATAH.

MILLING TESTS.

Entry No.	Laboratory Entry.	Variety.	Grown at—	Moisture of Wheat.	Percentage of Flour.	Ease of Milling.	Colour of Flour.
				%	%		
			CLASS 3003.				
10524	A	Florence	Saddleworth	12·5	73·3	Easy	Poor
10525	B	Quality	Willunga	13·2	73·4	Easy	Very fair
10526	C	Quality	Blyth	12·5	72·5	Easy	Poor
10527	D	Dundee	Salisbury	13·1	72·8	Easy	Very fair
10528	E	Florence	Riverton	13·0	72·8	Easy	Very fair
10529	F	Florence	Riverton	12·9	71·8	Easy	Very fair
10530	G	Pusa	Cummins	12·5	74·0	Hard to mill.	Very poor
			CLASS 3004.				
10531	H	Quality	Crystal Brook	13·4	75·3	Easy	Very poor
10532	I	Dundee	Wepowie	12·9	72·0	Very Easy	Very poor
10533	J	Quality	Yeelanna	12·9	70·5	Easy	Fair
10534	K	Quality	Koolunga	12·2	73·2	Easy	Very fair
10535	NN	Quality	Narridy	12·7	76·5	Easy	Very poor
			CLASS 3005.				
10536	L	Penn	Saddleworth	12·3	71·8	Easy	Excellent
10537	M	Ford	Kooringa	12·4	71·8	Easy	Very good
10538	N	Nabawa	Kooringa	13·0	70·4	Easy	Very good
10539	O	Pine Vale	Rosedale	12·9	68·8	Hard to mill.	Very good
10540	P	Nabawa	Freeling	13·0	74·2	Easy	Very good
10541	Q	Nabawa	Ungarra	12·9	72·4	Easy	Fair
10542	R	Nabawa	Riverton	12·7	70·6	Easy	Very good
10543	OO	Ford	Maitland	12·9	71·2	Easy	Very good
10544	T	Nabawa	Yorketown	12·5	73·6	Easy	Very good
			CLASS 3006.				
10545	S	Ford	Yeelanna	13·4	74·0	Easy	Very good
10546	U	Nabawa	Yaninee	12·1	71·8	Easy	Very good
10547	V	Gresley	Yeelanna	13·0	71·7	Very easy	Very good
10548	PP	Nabawa	Narridy	12·5	69·3	Easy	Excellent
			CLASS 3007.				
10549	W	Grellet	Saddleworth	12·4	72·5	Easy	Excellent
10550	X	Sword	Kooringa	12·6	72·8	Very easy	Very good
10551	Y	Pine Head	Rosedale	12·1	71·4	Hard to mill.	Excellent
10552	Z	Ranee 4H	Blyth	12·0	71·4	Easy	Very good

MILLING TESTS—*continued.*

Entry No.	Laboratory Entry.	Variety.	Grown at—	Moisture of Wheat.	Percentage of Flour.	Ease of Milling.	Colour of Flour.
				%	%		
			CLASS 3007—*continued.*				
10553	BB	Waratah	Ungarra	12·7	70·5	Easy	Very good
10554	CC	Ranee 4H	Terka	12·3	69·4	Hard to mill.	Excellent
10555	DD	Waratah	Riverton	12·7	71·3	Very easy ..	Fair
10557	RR	Sword	Maitland	15·1	66·8	Easy	Very good
10558	FF	Ranee	Yorketown	12·5	69·9	Easy	Very good
			CLASS 3008.				
10559	EE	Late Gluyas	Yeelanna	13·3	70·4	Easy	Very good
10560	GG	Felix	Lameroo	12·8	70·2	Easy	Very good
10561	HH	Waratah	Yaninee	12·4	71·6	Easy	Poor
10562	II	Turvey	Black Rock	12·9	73·3	Very easy ..	Very good
10563	JJ	Sword	Yeelanna	12·8	73·3	Very easy ..	Very good
10564	KK	Ranee 4H	Koolunga	12·7	70·5	Easy	Excellent
10565	LL	Merriden	Koolunga	12·9	71·1	Easy	Very good
10566	MM	Waratah	Narridy	13·6	71·6	Very easy ..	Very good
10567	AA	Ranee	Brinkworth	12·4	70·3	Easy	Very good

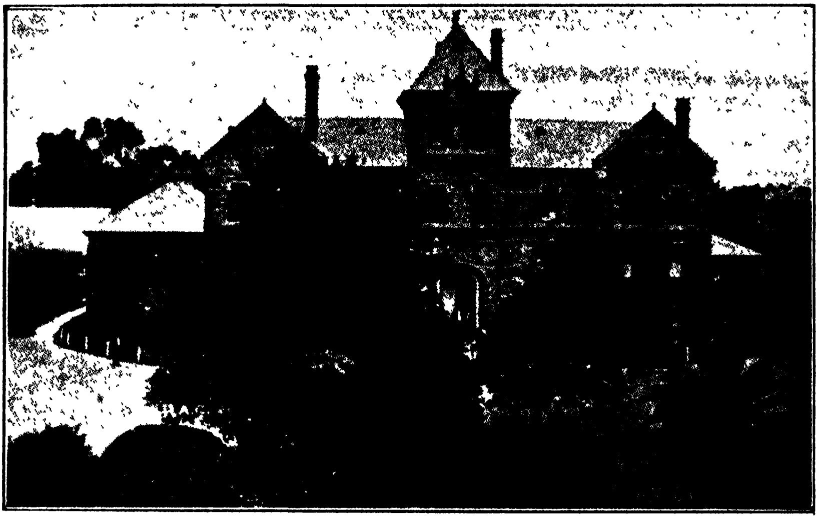
CHEMICAL AND BAKING TESTS.

Class.	Laboratory Entry.	Variety.	Protein on 13·5 per cent. Moisture Basis.	Water Absorption, 15 per cent. Moisture Basis.	Ash.	Baking Test.		Baking Score, Maximum, 50 points.	Wholemeal Fermentation Time Test.	Hydrated Maltose.
						Loaf Volume.	Weight.			
			%	%	%	mls.	grammes.			%
3003..	A	Florence ..	11·17	68·7	·40	460	138·8	43	64	2·8
3003..	B	Quality ..	9·54	67·9	·43	420	140·5	41	77	3·6
3003..	C	Quality ..	12·78	62·1	·44	475	134·4	44	43	2·0
3003..	D	Dundee ..	8·63	56·0	·49	280	132·3	27	113	2·3
3003..	E	Florence ..	9·85	68·8	·46	385	140·0	37	158	2·8
3003..	F	Florence ..	9·46	68·7	·48	405	140·5	38	138	2·7
3003..	G	Pusa	10·29	64·2	·45	415	134·9	41	188	2·7
3004..	H	Quality ..	12·33	63·3	·45	405	135·1	41	62	2·4
3004..	I	Dundee ..	11·72	60·2	·48	385	132·6	38	146	3·0
3004..	J	Quality ..	9·72	61·9	·43	440	133·0	41	37	1·6
3004..	K	Quality ..	8·91	64·1	·47	345	136·9	36	46	3·6
3004..	NN	Quality ..	10·40	64·6	·49	420	133·8	41	37	3·4

CHEMICAL AND BAKING TESTS—*continued.*

Class.	Laboratory Entry.	Variety.	Protein on 13·5 per cent. Moisture Basis.	Water Absorption, 15 per cent. Moisture Basis.	Ash.	Baking Test.		Baking Score, Maximum, 50 points.	Wholemeal Fermentation Time Test.	Hydrated Maltose.
						Loaf Volume.	Weight.			
			%	%	%	mls.	grammes.			%
3005..	L	Penn	7·85	55·9	·47	420	128·7	34	42	1·1
3005..	M	Ford	10·52	54·2	·40	440	127·3	43	93	0·8
3005..	N	Nabawa ..	7·47	55·4	·42	425	131·0	39	38	1·1
3005..	O	Pine Vale .	6·13	54·8	·39	345	128·0	32	69	1·0
3005..	P	Nabawa ..	7·02	56·3	·44	375	132·0	35	30	2·0
3005..	Q	Nabawa ..	8·03	59·0	·40	362	136·2	33	31	2·2
3005..	R	Nabawa ..	7·48	59·0	·45	415	132·7	38	64	1·6
3005..	OO	Ford	8·14	54·2	·42	360	129·0	35	77	1·3
3005..	T	Nabawa ..	10·35	55·6	·47	405	130·6	38	38	1·5
3006..	S	Ford	8·43	54·6	·43	405	128·7	37	87	1·2
3006..	U	Nabawa ..	10·71	55·7	·41	410	129·8	39	43	1·2
3006..	V	Gresley ...	10·14	57·7	·37	390	129·9	39	49	1·1
3006..	PP	Nabawa ..	6·04	55·1	·46	400	128·0	31	28	2·0
3007..	W	Grellet ...	7·40	51·6	·40	395	125·2	32	35	1·0
3007..	X	Sword	9·48	53·1	·39	400	126·2	37	42	0·9
3007..	Y	Pine Head	6·77	51·7	·46	335	126·1	28	17	1·3
3007..	Z	Ranee 4H	9·91	55·9	·42	415	128·1	37	28	1·6
3007..	BB	Waratah .	7·38	55·1	·39	375	127·6	33	25	1·5
3007..	CC	Ranee 4H	6·57	55·2	·39	365	128·3	34	21	1·4
3007..	DD	Waratah .	8·90	55·3	·38	390	127·9	34	48	1·5
3007..	RR	Sword	7·11	54·4	·40	385	127·5	34	40	1·1
3007..	FF	Ranee	9·90	55·7	·40	395	128·6	35	38	1·3
3008..	EE	Late Gluyas	6·46	56·2	·40	385	128·6	34	32	1·3
3008..	GG	Felix	7·27	56·3	·45	415	128·4	35	33	1·0
3008..	HH	Waratah .	11·97	53·6	·48	360	129·9	31	38	1·0
3008..	II	Turvey ..	7·66	56·1	·45	420	130·1	35	33	1·5
3008..	JJ	Sword	10·15	56·5	·42	445	128·3	37	48	1·1
3008..	KK	Ranee 4H	6·70	56·7	·40	400	127·0	32	28	1·9
3008..	LL	Merriden .	6·83	58·4	·40	395	130·9	33	44	1·7
3008..	MM	Waratah .	6·24	54·7	·38	350	128·7	29	27	1·4
3008..	AA	Ranee	8·88	57·2	·41	400	129·3	36	50	1·3

NOTE.—Owing to the transfer of entry T from Class 3006 to 3005, entry AA from Class 3007 to 3008 and entry FF from class 3008 to 3007, after the tests were completed, the photographs for these three entries are in other than their right classes.



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RESULT OF WHEAT CROP COMPETITIONS, SEASONS, 1935-36.

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100

TATIARA.

Judged by E. S. Alcock (District Agricultural Instructor).

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	E. J. Buckley, Bordertown	Gallipoli	34	24½	18½	14½	4½	96
2	R. A. Grosser, Wolseley	Gallipoli	33	24	18	14½	4½	94
3	Fisher Bros., Bordertown	Ghurka	33	23½	18½	14½	4	93½
4	A. E. England, Bordertown	Bencubbin ..	32	23½	18	14½	4½	92½
5	D. R. Milne, Bordertown	Ranee and Ranee 4H	32	23	18½	14	3½	91
5	Mrs. McBain and Davis, Keith	Ranee and Nabawa	33	23	18	13½	3½	91
7	H. C. M. Pilgrim, Wolseley	Ranee 4H .	33	22	17	14	4	90
8	M. McIntyre, Keith ..	Nabawa	32	23	16	13½	4½	89
8	J. D. Mayes, Wolseley	Federation, Bencubbin, Ranee 4H	32	21	18	13½	4½	89
10	S. W. Pitcher, Bordertown	Ranee	32	21	17½	13½	3½	87½
10	D. R. Milne, Bordertown	Ghurka	31	21	17½	14	4	87½
12	E. W. Sharrad, Wolseley	Ranee 4H, Gallipoli	31	23	17	13	3	87
12	H. C. M. Pilgrim, Wolseley	Ranee 4H ..	31	21	17	14	4	87
12	J. D. Mayes, Wolseley	Ranee 4H ..	31	20½	17	14	4½	87

MID-NORTHERN DISTRICT.

Judged by E. L. Orchard, District Agricultural Instructor.

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	W. Ryan, Halbury ..	*Sword	34	24½	19½	14	3	95
2	W. R. R. Simon, Halbury	*Sword	34	22	19½	14	5	94½
3	A. Maitland, Rochester	*Ranee 4H ..	34½	23	19	13	4	93½
4	E. Smart, Gulnare ...	Dundee and *Nabawa	35	24	19	12	3	93
5	M. Smart & Son, Gulnare	Dundee	34	24	19	12	3	92
6	A. Maitland, Rochester	*Nabawa....	32½	24	19	13	3	91½
7	W. G. Darmody, Rochester	*Ranee 4H and *Nabawa	34	22	19	13	3	91
7	M. Smart & Son, Gulnare	Aussie	35	24	19	10	3	91
9	G. A. Smallacombe, Georgetown	Bencubbin ..	33	23	17½	13	4	90½
10	J. L. Noonan, Gulnare	*Nabawa....	32	23	17	14	3½	89½
11	J. L. Noonan, Gulnare	*Sword	32	22	17	14	3½	88½
12	Spencer Bros., Koolunga	*Dundee and Warden's	30½	23	19	13	2½	88
13	H. S. and O. S. Freeman, Koolunga	Ranee	30½	22	19	12	3	86½
14	J. T. Clothier, Rodhill	*Ranee 4H and *Sword	29	23	18	13	3	86
15	Spencer Bros., Koolunga	Ranee	30½	23	19	10	3	85½
16	H. S. and O. S. Freeman, Koolunga	Sword	29	22	18	13	3	85

*Crops recommended for seed.

RESULT OF WHEAT CROP COMPETITIONS—*continued.*

FLINDERS.

Judged by H. D. ADAMS, District Agricultural Instructor.

Position.	Name and Address of Competitor.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
1	W. Watkins, Yeelanna	Sword	35	24½	19	14	4½	97
2	H. Glover, Yeelanna..	Sword, Ford	34	24	19½	14	4	95½
3	W. Modra, Yeelanna .	Sword	33	24½	19	13½	4½	94½
3	R. R. Wilson, Yeelanna	Ford	33	24	19	14	4½	94½
5	W. Watkins, Yeelanna	Gluyas......	33	24	19	13½	4	93½
6	R. Proctor, Yeelanna	Ford	33	23½	19½	13	4	93
7	R. R. Wilson, Yeelanna	Ford, Pusa .	32	23½	19	13½	4½	92½
8	J. C. Harder, Pillana .	Sword	30	24	19½	14	4	91½
9	G. & A. Lawrie, Ungarra	Ford	29	24	19	15	4	91
10	Smith Bros., Yeelanna	Ford	30	24	18½	13½	4	90
10	Smith Bros., Yeelanna	Sword, Ford..	30	24	18½	13½	4	90
10	R. G. Carr, Lipson ...	Sword	29	24	19	14	4	90
10	J. K. Schramm, Ungarra	Sword	28	25	18½	14	4½	90
14	G. & A. Lawrie, Ungarra	Sword	28	24½	19	14	4	89½
15	F. & M. Lawrie, Ungarra	Gluyas......	29	24	18½	13½	4	89
15	Palm Bros., Pillana ..	Major, Ford	29	23½	18	14	4½	89
17	F. & M. Lawrie, Ungarra	Gluyas......	28	23½	18½	13½	4	87½
17	F. C. Telfer, Ungarra .	Gluyas and Waratah	27	24	19	13½	4	87½
19	J. Gordon, Ungarra ..	Waratah and Ghurka	26	23	19	13	4	85
20	J. H. Clothier, Brimpton Lake	Currawa	23	23	18½	13	4	81½
21	P. H. Wagner, Brimpton Lake	Ford	21	23	18½	14½	4	81
22	M. Aikenhead, Brimpton Lake	Sword	20	23½	18½	14½	4	80½
23	M. Aikenhead, Brimpton Lake	Nabawa, Sword	19	23½	18	14½	4	79
24	D. Butler, Ungarra ..	Aussie	18	23½	18½	13½	4	77½
25	A. Hains, Brimpton Lake	Sword, Dan .	19	22½	18	13	4	76½
25	R. L. Myers, Mount Hope	Gluyas......	18	23	18	14	3½	76½

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REPORT ON VISIT TO NORTHERN DISTRICTS SUBJECT TO GRASSHOPPER INVASION.

[J. Davidson, D.Sc., Waite Research Institute.]

During the period Monday, 9th September, to Tuesday, the 17th, the writer visited certain districts in the northern part of the agricultural areas and north-western pastoral areas, accompanied by Messrs. J. N. McGilp, of the Pastoral Board, and F. N. Ratcliffe, of the Council for Scientific and Industrial Research. The object of the trip was to visit localities which were infested with grasshoppers during the past two years, with a view to determining the endemic areas inhabited by the plague grasshopper.

No grasshoppers were seen in the pastoral country west of the Flinders Range, although several areas were visited which were invaded by winged swarms last season. Owing to the recent rains throughout the pastoral country and cool weather, scattered flying hoppers would not be active on the wing, even if present. The pastoralists in the various districts reported that none had been seen this spring.

The return route was through the Gawler Rangers, and no grasshoppers were seen. It was reported to me that small hatchings had been observed in the Kimba district. Certain areas in the Gawler Ranges appear to be suitable as endemic areas for the plague grasshopper. It is evident, however, that egg beds and hatching hoppers may pass unobserved, owing to the character of the country. The insect may be present in small numbers every year in suitable spear grass flats or other favourable situations. It is proposed to investigate these areas in greater detail.

Since returning to Adelaide a letter was received from Mr. Roy Brooke, of Nullabor Station *via* Coorabie. Mr. Brooke states that grasshopper swarms were observed during July and August on this station. Each swarm covered an area of some 500 to 700 acres. The earlier swarms travelled N.E., and later swarms travelled S.E. Favourable rains have been experienced over the eastern portion of Nullabor. It would appear that these districts may form an important endemic area for the migrating grasshopper. The recent invasion of the West Coast agricultural areas appears to have developed from this region and portions of the Gawler Ranges.

From information now available, it is unlikely that the West Coast agricultural districts will be subject to a widespread plague of grasshoppers this season. Hatching of hoppers may be expected in some districts as an aftermath of the recent infestation. Some flying hoppers may advance into these districts, later in the season, from the eastern areas of the Nullabor plain. A watch should be maintained in the agricultural areas of the West Coast, so that early control measures may be adopted should the necessity arise.

In the northern agricultural areas east of the Flinders Range and south to east of Port Augusta, young hoppers are present over a wide area. The infested districts extend from the south of Hawker, and east from Quorn and Wilmington across the plains. Although the hoppers extend over a relatively wide area, they are thinly scattered, and are not grouped in the characteristic dense swarms observed last season. Although the insects have hatched from three to five weeks ago, they are small, appear sluggish and variable in colour. Some dead hoppers were seen, and I was informed that many had died in some districts. The retarded development of the hoppers may be due to the lower temperatures during August and September. They will doubtless become more active as the weather becomes warmer. Owing to the thinly scattered distribution of the hoppers, control measures by baiting are more difficult at present, since the bait will have to be distributed over a relatively large area.

The travelling stock roads are one of the chief sources of infestation of crops in these districts. Mr. Barker, clerk of the district council of Wilmington, took me over the district, and hoppers had hatched freely from the stock road and other reserves. They had then advanced into neighbouring crops. This was noted on the properties of Mr. P. Cromer and Mr. E. L. Searle. Mr. Barker was distributing poison bait over the infested council's reserve near the town. Hoppers had also hatched in hard, bare patches in non-cultivated paddocks used for grazing purposes.

A few young hoppers have hatched since the recent rains. The numbers of hoppers found scattered over the area during my visit will not constitute a widespread serious plague, although they may be of local importance in the infested districts. "Baiting" measures should be carried out wherever practicable.

The thinly scattered distribution of the hoppers in these districts may be due to four considerations:—

(1) Small number of scattered egg pods laid last summer in these areas.

(2) Poor hatching of eggs due to inadequate early rains. Observations should be made to establish whether new hatchings occur in these districts following on the recent rains. This is important, since more extensive hatchings may lead to the development of denser local swarms with the approach of warmer weather.

(3) Many eggs have been destroyed by egg wasp parasites; *Scelio fulgidus* Crawford was observed to be active in several districts last season.

(4) The swarming phase of the species, which results in widespread plagues, may be less in evidence; the insects may be tending to the "solitary" or scattered phase. Other allied species may be present.

It is not possible to determine at present the part played by each of these different factors. Mr. D. C. Swan, Assistant Entomologist at the Waite Institute, is visiting the area early in October with Mr. E. L. Orchard in order to make more detailed observations on the situation. The endemic areas from which these districts become infested from time to time appear to lie north of this region, extending into the pastoral country along the ranges.(*)

The fundamental feature of "locust" plagues is that the particular species occur in a solitary, non-gregarious or non-migrating phase, in definite endemic areas. They develop into the gregarious swarming phase in certain years, and give rise to "plagues." It is of fundamental importance that the behaviour of our migrating grasshopper in this respect should be thoroughly investigated, and the endemic areas established.

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* From investigations made by Mr. D. C. Swan in October it was found that the grasshoppers now present in the area consist mainly of a species of *Austroicetes*, probably *A. pusilla* Walk. The plague grasshopper (*Chortoicetes terminifera* Walk.) which was widely present on the area last season, is now poorly represented.

A COMPARISON OF BARLEY AND WHEAT AS A BASAL FOOD FOR PIGS.

[R. BAKER, R.D.A., Dairy Superintendent, Roseworthy Agricultural College.]

Over a great portion of the settled areas of South Australia, existing conditions are eminently suited to the raising of pigs for market. The climate in the main is ideal, suitable pigs are available for the foundations of a herd, and the fact that our farmers are able to grow large quantities of wheat and barley guarantees the supply of the most important basal foods, which, with the judicious use of suitable supplementary foods should make it possible to provide pigs in large numbers suitable to any market.

Low prices have been ruling for all cereals and the man on the land has of necessity interested himself in farm side lines. Pig raising is one of the most profitable of side lines, and the number of pigs raised has gradually increased until the demand for local requirements has been oversupplied. Fortunately, the market from time to time is relieved by the purchase of pigs for export, and values have been maintained at a payable level.

With a fully supplied market, pigs of an inferior type and feeding have become more and more difficult to dispose of at a price that would show some returns over food consumed and labour expended. Although the number of unsuitable pigs seen at our abbatoirs during the past twelve months has considerably decreased, there is still room for improvement of both type and feeding practice, particularly if our efforts to create a market overseas are to be successful. It must be realised that to become an exporting State success depends largely on continuous supply of pigs uniform in weight, and of a type suitable for trade.

That such pigs can be produced in South Australia is beyond doubt, and with some encouragement farmers for the most part should be able to succeed, especially when it is remembered that the correct breeds of pigs are now readily available, and the country is over-producing such valuable foodstuffs as wheat and barley.

Per medium of the press, public lectures, and export competitions, the type of pig required has been adequately defined, and it remains with the pig producer to carry out a definite system of breeding and feeding in order to compete in available markets against countries more favourably situated, or at least more advanced in the ways and means of exploiting export markets.

OUTLINE OF THE TEST.

At the suggestion of the Principal, Dr. A. R. Callaghan, feeding trials were instituted at the College piggery, the object being primarily, a comparison of the feeding of barley and wheat, with and without supplementary foods, to pigs of various breeding. The prime object was to assess the relative speed and economy in attaining a bacon weight of 160-180lbs. from the weaner stage, 40-60lbs. live weight. A second but subsidiary object was to ascertain the suitability of the carcass so fed for export, by submitting them to criticism by recognised men in the trade, both local and overseas.

FEEDING.

To provide a carcass carrying a wealth of lean meat the animal should be fed a protein rich ration, in other words a ration rich in flesh forming material. The basal foods, barley and wheat, used extensively in South Australia, are more or less deficient in this important nutrient and in order to provide a better balance, supplementary foods such as meat-meal, skim milk, and lucerne, all containing a relatively high percentage of protein, are necessary. Consequently, in addition to the feeding of barley and wheat alone, the supplementary foods, meatmeal, skim milk, and lucerne were used to comprise the following rations:—

Lot 1.—Barley.

Lot 2.—Barley and meatmeal, in the proportion of 100lbs. of barley and 5lbs. of meatmeal.

Lot 3.—Barley, skim milk, and lucerne, in the proportion of 100lbs. barley, 100lbs. skim milk, and 25lbs. of lucerne.

Lot 4.—Wheat.

Lot 5.—Wheat and meatmeal, in the proportion of 100lbs. of wheat and 5lbs. of meatmeal.

Lot 6.—Wheat, skim milk, and lucerne, in the proportion of 100lbs. wheat, 100lbs. skim milk, and 25lbs. of lucerne.

As far as was practicable all pigs were given as much food as they would consume daily, the grain in all cases being crushed. In Lots 2 and 5 the meat-meal was mixed with the grain before feeding; in Lots 3 and 6, the skim milk was mixed with the grain in the feed trough, so that all the pigs in the pen would obtain, as near as possible an equal share, the lucerne being fed during the day. An ample supply of drinking water was provided at all times. Throughout the test, grain of a similar quality was fed, the barley was rather pinched carrying a fairly high percentage of fibre, and the wheat was an average sample.

BREEDING.

The test was carried out with pigs of different breeding. This was necessary to get numbers required for the experiment and also to ascertain the relative merits of different breeds fed on similar rations.

Breed.	No.	No. of Litters.	Date of Birth.
Berkshire (Old Type)	6	2	4 on 16th October, 1933 2 on 29th October, 1933
Large White x Berkshire	12	2	6 on 30th October, 1933 6 on 13th November, 1933
Tamworth x Berkshire	6	1	30th October, 1933
Large White x Mid York	6	1	29th October, 1933
Large White x Tamworth x Berkshire	6	1	8th November, 1933

ARRANGEMENT OF PENS.

The 36 pigs were divided into six feeding lots, each pen consisting of 1 Berkshire, 2 Large White x Berkshire, 1 Tamworth x Berkshire, 1 Large White x Mid York, and 1 Large White x Tamworth x Berkshire. The pens were so arranged to make the initial total weight of each pen as near as possible alike.

Lot 1.	272lbs.
Lot 2.	278lbs.
Lot 3.	283lbs.
Lot 4.	276lbs.
Lot 5.	273lbs.
Lot 6.	275lbs.

In carrying out the test all pigs were weighed prior to the commencement of feeding, and in order to ascertain progress of development the pens were weighed at fortnightly intervals. Daily records were kept showing the consumption of food in each pen. On reaching bacon weight individual pigs were sent to the Government Produce Department at Port Adelaide, where they were slaughtered. Here cold dressed weights were recorded, and the carcasses criticised as to their suitability for export. They were then held in cold stores until the completion of the test, before being sent to England for further comment and sale.

Arrangements demanded the pigs to be slaughtered on certain days, and for this reason a standard weight for the finished animal could not be adhered to. It will be noticed also from the final figures that a number of pigs were disposed of at a weight lower than was originally intended; this was due solely to the prolonged feeding period and the reluctance of pigs so fed to reach bacon weight.

Had the pigs been held until fully developed the daily increase in a number of cases would have been lower than the figures shown in the completed table This is particularly so with pens fed simple rations, *i.e.*, wheat and barley. It also applies, but to a much lesser degree, to the pen of pigs fed barley and meatmeal. In this pen two individuals failed to reach the desired weight by the time it was decided to complete the test, a period of 142 days. Actually the data record the increase in weight of the various groups within a certain time limit.

In all, 31 pigs were sent overseas; of the remainder, two were held at the depot and disposed of locally and three were slaughtered on the farm. The following table shows in detail the figures at the completion of the test:—

TABLE I.—*Showing the Amount and Rate of Increase of Individuals and Pens under Different Rations.*

Breeding.	Tag.	Initial Weight.	Final Weight.	Increase.	Days Fed.	Increase per Day.
		Lbs.	Lbs.	Lbs.		Lbs.
Lot 1.—Barley.						
Berkshire	K61	47	155	108	142	·760
Large White x Berkshire	XX	39	130	91	141	·647
Large White x Berkshire	K63	36	145	109	142	·767
Tamworth x Berkshire	249	59	167	108	114	·947
Large White x Mid York	K60	52	163	111	142	·781
Large White x Tamworth x Berkshire	K62	39	174	135	142	·950
Total	—	272	934	662	823	4·852
Mean	—	45·33	155·66	110·33	137·16	·809
Lot 2.—Barley and Meatmeal, 100 : 5.						
Berkshire	250	53	164	111	114	·973
Large White x Berkshire	389	35	168	133	128	1·039
Large White x Berkshire	390	45	164	119	128	·929
Tamworth x Berkshire	B69	51	150	99	142	·697
Large White x Mid York	388	53	174	121	128	·945
Large White x Tamworth x Berkshire	XX	41	130	89	142	·626
Total	—	278	950	672	782	5·209
Mean	—	46·33	158·33	112	130·33	·868

TABLE I.—*Showing the Amount and Rate of Increase of Individuals and Pens under Different Rations.*—continued.

Breeding.	Tag.	Initial Weight.	Final Weight.	Increase.	Days Fed.	Increase per Day.
		Lbs.	Lbs.	Lbs.		Lbs.
Lot 3.—Barley, Skim Milk and Lucerne, 100 : 100 : 25.						
Berkshire	240	47	183	136	86	1·581
Large White x Berkshire	239	40	178	138	86	1·604
Large White x Berkshire	243	39	165	126	100	1·260
Tamworth x Berkshire	232	69	165	96	58	1·655
Large White x Mid York	242	41	165	124	100	1·240
Large White x Tamworth x Berkshire	238	47	180	133	86	1·546
Total	—	283	1,036	753	516	8·886
Mean	—	47·16	172·66	125·50	86	1·481
Lot 4.—Wheat.						
Berkshire	XX	48	148	100	141	·709
Large White x Berkshire	K64	43	142	99	142	·697
Large White x Berkshire	K65	41	142	101	142	·711
Tamworth x Berkshire	391	55	168	113	130	·869
Large White x Mid York	392	56	167	111	130	·854
Large White x Tamworth x Berkshire	K66	33	125	92	142	·648
Total	—	276	892	616	827	4·488
Mean	—	46	148·66	102·66	137·83	·741
Lot 5.—Wheat and Meatmeal, 100 : 5.						
Berkshire	248	40	169	129	114	1·131
Large White x Berkshire	244	42	169	127	100	1·270
Large White x Berkshire	245	42	163	121	100	1·210
Tamworth x Berkshire	247	53	161	108	114	·947
Large White x Mid York	237	51	159	108	86	1·256
Large White x Tamworth x Berkshire	246	45	161	116	114	1·017
Total	—	273	982	709	628	6·831
Mean	—	45·5	163·66	118·16	104·66	1·138
Lot 6.—Wheat, Skim Milk and Lucerne, 100 : 100 : 25.						
Berkshire	241	37	184	147	100	1·470
Large White x Berkshire	234	44	168	124	72	1·722
Large White x Berkshire	233	52	181	129	72	1·792
Tamworth x Berkshire	236	42	173	131	86	1·523
Large White x Mid York	231	68	174	106	58	1·828
Large White x Tamworth x Berkshire	235	32	173	141	86	1·639
Total	—	275	1,053	778	474	9·974
Mean	—	45·83	175·50	129·66	79	1·664

Due to the fattening propensity of the individual under different rations, the range in time when pigs reached bacon weights varies greatly; still it will be noticed that the range has a definite relationship to the composition of the ration used.

In the feeding of barley or wheat, the time required is relatively much longer than when supplements such as skim milk and lucerne are used; this is to be expected, for both the latter have high protein content and are greatly relished by pigs. In the cases of both wheat and barley, time of feeding ranged from 130 to 142 days, with the respective averages of 137.83 and 137.16 days. With the addition of skim milk and lucerne the duration of feeding was reduced to from 58 to

100, an average of 86 days in case of barley, and with wheat from 58 to 100, an average of 79 days.

The reduction in time of feeding is attributed chiefly to the better balanced nature of the ration, but also in some measure to the increased palatability of the foods when used in addition to basal grain, which leads to better assimilation of all ingredients. The rapidity of development was particularly noticeable in pigs few skim milk and lucerne.

The addition of meatmeal, although it increased the protein of the ration, it did not bring about a very marked reduction in time of feeding with barley, the range being from 114 to 142, an average of 130.33 days, but with wheat an appreciable reduction was noticed, from 86 to 114, an average of 104.66 days.

The highest daily increase was obtained by pigs on a ration of wheat, skim milk and lucerne, they showed a mean increase of 1.662lbs. per day, ranging from the Large White x Mid York, 1.828lbs. per day to the Berkshire, 1.470lbs. The ages of these two pigs were identical, but the former, according to initial weight was more matured at the commencement of feeding and during the first six weeks increased rapidly, showing the remarkable figure of approximately 2¼lbs. increase in weight, or a little over 1½lbs. of pork per day, during the second fortnight. The Large White x Berkshire also showed early maturing tendencies under this class of feeding, and pigs of this breeding were very little behind at the completion of the test. The Large White x Tamworth x Berkshire, on the other hand, was rather slow in developing during the initial stages, but fattened rapidly towards the end. The pigs fed barley, skim milk and lucerne, although showing a satisfactory mean increase of 1.481lbs. per day did not compare quite as favourably with those fed wheat, skim milk, and lucerne. In this instance the Tamworth x Berkshire showed the greatest daily increase, 1.655lbs., while the Large White x Mid York recorded the lowest returns, 1.240lbs. Here again the Tamworth x Berkshire was more mature at the commencement of the test, and although only a day younger than the Large White x Mid York, its capacity for assimilating food and its ability to fatten was greater. This individual capacity for development is again demonstrated with the two Large White x Berkshires, whose difference in age was 14 days, with the initial weight of the younger 1lb. heavier than the elder and their respective rates of increase 1.604lbs. and 1.260lbs. As in the wheat pen, the Large White x Tamworth x Berkshire was again rather slow at the beginning of feeding, but finished above the average of the pen.

MEATMEAL AS A SUPPLEMENT.

It is recognised that both the basal foods, barley and wheat, are deficient in protein, and used alone are not sufficient to satisfy the feeding requirements of present-day market pigs. With this fact in view it was thought that by the addition of meatmeal, a food containing a high percentage of digestible protein, the increase in growth of the pig would be influenced.

From the results obtained in this experiment, this supposition was clearly proved. By the mere addition of meatmeal as a supplement to wheat in the ration, a mean daily increase of 0.497lbs. was obtained from pigs fed on this ration over and above the increase obtained from wheat alone. In the cases where barley was used in the ration the increases due to the addition of meatmeal were not so noticeable, and, in fact, were very disappointing.

This is difficult to understand in view of the fact that barley showed to advantage over wheat when fed alone. The conditions might be attributed to the unpalatable and fibrous nature of the barley, which was not altered to any marked extent by the addition of meatmeal.

It will be obsered that in both groups fed meatmeal the Tamworth x Berkshire than wheat, the respective mean daily being .809lbs. and .748lbs.

COMPARISON OF WHEAT AND BARLEY FED ALONE.

From the results obtained the feeding of barley showed slightly better returns than wheat, the respective mean daily being .809lbs. and .748lbs.

Apparently the difference between the two groups of pigs would have been greater had all the individual pigs been allowed to continue feeding to bacon weight. Four pigs from those on the plain ration of wheat were disposed of before they had reached bacon weight, whereas only two pigs from those on the barley ration were slaughtered before they had reached bacon weight. In passing it is worthy of notice that the Tamworth x Berkshire and the Large White x Tamworth x Berkshire pigs from the group on the barley ration increased more rapidly than pigs of other breeding. Among the pigs fed on wheat ration the Tamworth x Berkshire and the Large White x Mid York matured slightly ahead of the pigs of other breeding.

RATE OF MATURITY.

The rate of increase of different breeding, irrespective of the system of feeding, is difficult to follow from figures obtained. In fact, it is impossible to state with any certainty whether the pigs of any particular breeding show any outstanding advantage over others with regards to early maturing tendencies. The final figures do not vary to any extent, there being only .08lbs. between the highest and lowest. Had feeding continued in all cases to a bacon weight it may have been possible to show more definite results; the Large White x Mid York would undoubtedly return the highest rate of maturity, while the lowest figures would probably be represented by the Large White x Tamworth x Berkshire.

QUANTITIES OF FOOD CONSUMED.

Table II. shows the total quantity of food consumed by the different groups of pigs, also the amount of food required to produce a pound of increase, and the quantity consumed per day, expressed as food and dry matter.

Ration.	Food Consumed.	Total Increase.	Total Feeding Days of Individual Pigs.	Consumed per Day.		Consumed per lb. of Increase.	
				Food.	Dry Matter.	Food.	Dry Matter.
	Lbs.	Lbs.	Days.	Lbs.	Lbs.	Lbs.	Lbs.
No. 1— Barley	3,752	662	823	4·56	4·12	5 67	5·12
No. 2— Barley	3,417·23	672	782	4·24	3·83	5·08	4·59
Meatmeal	170·77	—	—	·22	·20	·25	·23
Total	3,588	—	—	4·46	4·03	5·33	4·82
No. 3— Barley	2,796	753	516	5·41	4·88	3·71	3·35
Skim Milk	2,796	—	—	5·41	·54	3·71	·37
Lucerne	699	—	—	1·35	·33	·93	·23
Total	6,291	—	—	12·17	5·75	8·35	3·95
No. 4— Wheat	3,076	616	827	3·72	3·32	4·99	4·46
No. 5— Wheat	2,777·61	709	628	4·42	3·95	3·92	3·50
Meatmeal	138·39	—	—	·22	·20	·19	·18
Total	2,916	—	—	4·64	4·15	4·11	3·68
No. 6— Wheat	2,452	778	474	5·17	4·62	3·15	2·81
Skim Milk	2,452	—	—	5·17	·51	3·15	·31
Lucerne	613	—	—	1·29	·32	0 78	·19
Total	5,517	—	—	11·63	5·45	7·08	3·31

The figures quoted in the table demonstrate that the total quantity of food consumed daily by the different pens depends mainly on the bulkiness of the ration. When foods containing a high proportion of water, such as skim milk, lucerne, &c., are fed in conjunction with grain, the total weight of food consumed each day is considerably higher than when grain alone is used, the water content of the food taking the place of part of that utilised in the ordinary way, and it is doubtful whether the combined weights of water and "dry matter" would vary to any great extent in different systems of feeding. This is illustrated by expressing the rations on the basis of dry matter.

The quantity of dry matter consumed per day by the different groups of pigs indicates that by the use of palatable supplements, greater use is made of the grain; in fact, the assimilation of all foods fed is increased. This is borne out by the quantity of dry matter that is necessary to produce one pound of increase. In addition to the palatability of a ration consisting of barley or wheat with skim-milk and lucerne, the protein content has been increased, creating a better balance to the grain, thereby providing a food that encourages the growth and the development of lean meat in the animal.

A comparison of the feeding of barley and wheat under corresponding conditions points in favour of wheat, for in each instance less wheat is required to produce 1lb. of increase. This in all probability is due to the nature of the barley used in the test. As pointed out it contained a fairly high percentage of fibre when compared with that of wheat.

It is of interest to note that each group of pigs supplied supplementary foods showed a decrease in the amount of dry matter required to bring about one pound of increase when compared with those fed grain alone, yet with the exception of the group fed barley and meatmeal, there was an increase in the quantity of dry matter consumed each day. The extent of the difference is illustrated in Table III.

TABLE III.

Ration.	Consumed per Day.	Increase.	Decrease.	Consumed per lb. of Increase.	Decrease.
	Lbs.	%	%	Lbs.	%
Barley	4·12	—	—	5·12	—
Barley and Meatmeal	4·03	—	2·18	4·82	5·86
Barley, Skim Milk and Lucerne...	5·75	39·56	—	3·95	22·85
Wheat	3·32	—	—	4·46	—
Wheat and Meatmeal	4·15	25·00	—	3·68	17·49
Wheat, Skim Milk and Lucerne...	5·45	64·15	—	3·31	25·78

COST OF FEEDING.

For the purpose of estimating the cost of feeding the different rations the following prices have been taken as representing approximately those ruling during the progress of the test:—

Wheat, 2s. 3d. per bushel, or .45 pence per lb.
Barley, 2s. per bushel, or .48 pence per lb.
Meatmeal, 17s. per 140lbs., or 1.45 pence per lb.
Skim milk, 1d. per gallon, or .1 pence per lb.
Lucerne, 30s. per ton, or .16 pence per lb.

The figures in Table IV. represent the value of food consumed per day and the value of food necessary to produce a pound of increase and a pound of pork. In estimating the difference between "increase" and "pork" a 30 per cent. decrease has been recognised.

TABLE IV.

Ration.	Showing the Cost of Feeding.				Cost per 1lb. of—	
	Total Food Consumed.	Total Increase.	Total Feeding Days of Individual Pigs.	Cost of Food Consumed per Day.	Increase.	Pork.
	Lbs.	Lbs.	Days.	*d.*	*d.*	*d.*
No. 1—						
Barley	3,752	662	823	2·18	2·72	3·88
No. 2—						
Barley	3,417·23	672	782	2·035	2·432	3·474
Meatmeal	170·77	—	—	·319	·362	·517
Total	—	—	—	2·354	2·794	3·991
No. 3—						
Barley	2,796	753	516	2·597	1·781	2·544
Skim Milk	2,796	—	—	·541	·371	·530
Lucerne	699	—	—	·216	·148	·211
Total	—	—	—	3·354	2·300	3·285
No. 4—						
Wheat	3,076	616	827	1·674	2·245	3·207
No. 5—						
Wheat	2,777·61	709	628	1·989	1·764	2·520
Meatmeal	138·39	—	—	·319	·275	·393
Total	—	—	—	2·308	2·039	2·913
No. 6—						
Wheat	2,452	778	474	2·327	1·417	2·024
Skim Milk	2,452	—	—	·517	·315	·450
Lucerne	613	—	—	·206	·125	·178
Total	—	—	—	3·050	1·857	2·652

The average cost of food per pig per day in the various pens shows an increase as the food value and the palatability increases. As already pointed out, by increasing the palatability a greater quantity of food is consumed, but better assimilation of food follows, and this is clearly reflected in the decreased cost of food necessary to produce a pound of pork. The percentage differences between costs are shown in the following table:—

TABLE V.

Ration.	Cost of Food per Day.		Cost of Food per 1lb. of Pork.		
		Increase.		Decrease.	Increase.
	d.	%	*d.*	%	%
Barley	2·180	—	3·88	—	—
Barley and Meatmeal	2·354	7·98	3·991	—	2·86
Barley, Skim Milk and Lucerne	3·54	53·85	3·285	15·34	—
Wheat	1·674	—	3·207	—	—
Wheat and Meatmeal	2·308	37·87	2·913	9·17	—
Wheat, Skim Milk and Lucerne	3·050	82·19	2·652	17·31	—

The value of increase over cost of food consumed by the various groups is shown in Table VI. In estimating the value of increase an average price of 5.547 pence has been taken. This figure represents the average price per pound of pork obtained from the net returns of pigs exported, after all charges and exchange were adjusted.

TABLE VI.

Ration.	Food Consumed.	Increase.	Cost of Foods.	Value of Increase.	Difference.
	P.	Lbs.	*s. d.*	*s. d.*	*s. d.*
Lot 1.—					
Barley	3,752	662	150 1	214 2½	64 1½
Lot 2.—					
Barley	3,417·23	672	157 4	217 5½	60 1½
Meatmeal	170·77	—	—	—	—
Lot 3.—					
Barley	2,796	753	144 5½	243 8	99 2½
Skim Milk	2,796	—	—	—	—
Lucerne	699	—	—	—	—
Lot 4.—					
Wheat	3,076	616	115 4	199 4	84 0
Lot 5.—					
Wheat	2,777·61	709	120 11½	229 5	108 5½
Meatmeal	138·39	—	—	—	—
Lot 6.—					
Wheat	2,452	778	120 6½	251 9	131 2½
Skim Milk	2,452	—	—	—	—
Lucerne	613	—	—	—	—

A comparison of the different pens shows the advantage of wheat feeding during this trial over a corresponding barley ration. This will be more readily understood when the difference in weight of a bushel of wheat and barley is taken into consideration, actually 1lb. of wheat cost .45d. against barley at .48d. for feeding purposes.

VALUE OF A BUSHEL OF GRAIN FED TO PIGS.

From figures quoted in previous tables it is possible to estimate the value of a bushel of barley or wheat fed to pigs under the conditions of the test.

TABLE VII.

Ration.	Cost of Grain Fed.		Value of Grain after Feeding to Pigs.		Per Cent. Increase by Feeding to Pigs.
	Per Bush. *s. d.*	Per Lb. *d.*	Per Bush. *s. d.*	Per Lb. *d.*	%
Barley	2 0	·48	2 10·25	·68	42·71
Barley (with Meatmeal)	2 0	·48	2 7·63	·63	31·79
Barley (with Skim Milk and Lucerne	2 0	·48	3 9·28	·90	88·66
Wheat	2 3	·45	3 10·65	·77	72·77
Wheat (with Meatmeal)	2 3	·45	4 7·01	·91	103·74
Wheat (with Skim Milk and Lucerne	2 3	·45	5 5·52	1·09	142·66

The figures in the column "Value of grain after feeding to pigs," are estimated on the average net price of all pigs sold overseas, 5.547 pence per lb. of pork. At this price an appreciable increase in the value of a bushel of grain is recorded in all cases.

The results from the ration of barley and meatmeal are somewhat disappointing when compared with barley alone; this appears to be due to two factors—one, the unpalatable nature of the barley, and two, the increased cost of feeding meatmeal. With a normal sample of barley it would be reasonable to expect an advantage by feeding meatmeal, as noticed in the difference of the results from the rations, wheat, and wheat and meatmeal. On the other hand, the addition of skim milk and lucerne with barley shows a decided advantage.

With regard to the pigs fed wheat, the addition of a palatable and nutritious food is reflected by a marked increase in the value of the grain consumed. Where skim milk and lucerne were used the results are outstanding.

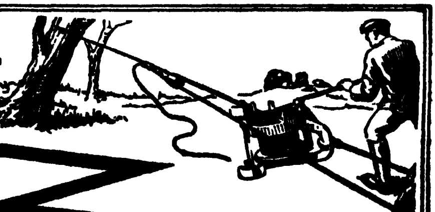
LOSSES IN DRESSING.

In the following tables the losses in dressing are shown, representing the difference between "farm weight," the weight immediately prior to leaving the farm without any interference in routine feeding, and a cold dressed weight recorded after the animal heat has left the body prior to freezing.

It will be noticed that the losses are greater where the pigs received barley as the basal food, with the greatest loss (30.51 per cent.) when skim milk and lucerne were fed in conjunction. Similarly with the pigs on a ration of wheat, the highest figure (28.49 per cent.) was obtained where the skim milk and lucerne were used in addition. This may be due to greater bulkiness and the presence of a higher percentage of water in the ration; being more bulky the animal would be carrying a greater quantity of undigested food at the time of slaughter. No special preparations were followed for killing, the pigs being slaughtered approximately 12 hours after leaving the farm. The best weights after slaughter were obtained when meatmeal was used as the supplement in both the wheat and barley rations. In such cases the bulk of the ration was less as a result of the meatmeal supplement, 27.91 per cent. and 28.66 per cent. respectively.

With pigs of different breeding the Berkshire rank the lowest, 28.31 per cent., and the Large White crossed with the Tamworth x Berkshire the highest, 29.89 per cent. It will also be seen that where the Berkshire represents half or more of the breeding the losses in dressing are lower. This may be due to the higher percentage of fat being carried by this class of animal over types that possess a wealth of lean meat which contains a higher percentage of water.

The average of all pigs, 29.09 per cent., represents very closely the recognised 30 per cent. difference between farm and dressed weights at the factory.



TEARING THEM OUT

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TREES and STUMPS, it matters not, they are torn out with roots intact, a thorough job quickly done. Run to the job like a [illegible] truck, and worked in the same manner as a boat is rowed. It develops the power of 200 men, progressively applied, and always under perfect control.

In any position, so long as the operator has space for a footing, the machine is efficiently worked. An Automatic Gear allows a load to be hauled or released at will. Besides the great power and portability there are embodied other labour saving features, such as special rope couplings, rope shortener, snatch block, etc.

Agriculturalists in Australia, New Zealand, Great Britain, South Africa, the Americas, as well as Planters in India, China, Central Africa, Fiji, the East and West Indies, recognised its merits and applied its help.

THE "MONKEY" GRUBBER

is fashioned from material mined and made within the Empire, by Empire craftsmen, to assist with the full and efficient development of Her Soil's resources.

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C

TABLE VIII.—*Showing the Difference between Farm Weights and Cold-Dressed Weight.*

Pen.	Breeding.	Feeding.	Farm Weight.	Cold-Dressed Weight.	Per Cent. of Loss.
			Lbs.	Lbs.	%
Lot 1	Berkshire	Barley	155	112	27·74
	Large White x Berkshire	—	130*	—	—
	Large White x Berkshire	—	145	97	33·57
	Tamworth x Berkshire		167	118	29·34
	Large White x Mid York	—	163	114	30·07
	Large White x Tamworth x Berkshire	—	174	118	32·19
	Total	—	804	559	30·45
Lot 2	Berkshire	Barley, 100	164	116	29·27
	Large White x Berkshire	Meatmeal, 5	168	117	30·06
	Large White x Berkshire		164	122	25·61
	Tamworth x Berkshire	—	150	106	29·34
	Large White x Mid York	—	174	124	28·80
	Large White x Tamworth x Berkshire		130*	—	—
	Total		820	585	28·66
Lot 3	Berkshire	Barley, 100	183	128	30·06
	Large White x Berkshire	Skim Milk, 100.	178	123	30·90
	Large White x Berkshire	Lucerne, 25	165	113	31·52
	Tamworth x Berkshire		165	117	29·10
	Large White x Mid York	—	165	115	30·31
	Large White x Tamworth x Berkshire	—	180	124	31·12
	Total	—	1,036	720	30·51
Lot 4	Berkshire	Wheat	148*	—	—
	Large White x Berkshire	—	142	102	28·17
	Large White x Berkshire	—	142	101	28·88
	Tamworth x Berkshire	—	168	122	27·38
	Large White x Mid York	—	167	120	28·15
	Large White x Tamworth x Berkshire	—	125	89	28·80
	Total	—	744	534	28·23
Lot 5	Berkshire	Wheat, 100.	169	124	26·63
	Large White x Berkshire	Meatmeal, 5	169	126	25·45
	Large White x Berkshire	—	163	119	27·00
	Tamworth x Berkshire	—	161	116	27·95
	Large White x Mid York	—	159	109	31·45
	Large White x Tamworth x Berkshire	—	161	114	29·20
	Total	—	982	708	27·91
Lot 6	Berkshire	Wheat, 100.	184	133	27·79
	Large White x Berkshire	Skim Milk, 100.	168	114	32·15
	Large White x Berkshire	Lucerne, 25	181	132	27·08
	Tamworth x Berkshire	—	173	123	28·91
	Large White x Mid York	—	174	124	28·74
	Large White x Tamworth x Berkshire	—	173	125	27·75
	Total	—	1,053	751	28·49

TABLE IX.—*Loss in Dressing with Different Breeding.*

Breeding.	Farm Weight.	Cold-Dressed Weight.	Per Cent. of Loss.
	Lbs.	Lbs.	%
Berkshire	855	613	28·31
Large White x Berkshire	1,785	1,266	29·08
Tamworth x Berkshire	984	702	28·66
Large White x Mid-York	1,002	706	29·54
Large White x Tamworth x Berkshire	813	570	29·89

TABLE X.—*Loss in Dressing, "Barley* v. *Wheat."*

	Farm Weight.	Cold-Dressed Weight.	Per Cent. of Loss.
	Lbs.	Lbs.	%
Barley	2,660	1,864	29·93
Wheat	2,779	1,993	28·25
Total of all Pigs	5,439	3,857	29·09

CRITICISM OF CARCASSES.

The carcasses of all pigs sent overseas were criticised as to their suitability for export, first at the Government Produce Department at Port Adelaide by Mr. Henschke, secondly, on arrival in England by Mr. Whitney, of the Stockbreeders Meat Company.

Before reviewing the comments it would be advisable to give Mr. Whitney's definition of what is required to meet the demands of the United Kingdom trade in both pork and bacon.

The Porker.—The pigs should be clean, well dehaired, and as near white finished carcasses as possible. The skin should be smooth and free from coarse wrinkles, the main object of design and general appearance, including finish, to be attractive. The hams should be well rounded and reasonably covered with fat, full of meat as possible right down to the hocks, with short and fine leg bones.

The loins should be a good length, also broad and full of flesh; that is to say, with a large eye piece of lean meat, with a fair covering of fat to the size of the carcass. The bellies should be compact with not too much leaf and well streaked with lean, also with a reasonable proportion of fat.

The shoulder should also be compact with the blade bones well set in, the whole tapering towards a small neck and fine short boned front legs. The size of the head should be in proportion to the weight of the carcass—the smaller the better at all times.

The fats should be white, firm and not oily, and only moderate in proportion to lean so that trimming is avoided when the carcasses are cut.

The 60/80lb. pigs are always the best sellers to the retail butchers. The 80/100lbs. also meet a fair demand, but they usually make slightly less money.

Although porkers are usually graded up to 120lbs., as soon as 100lbs. weight are exceeded values as a general rule decline in accordance with weight, owing to the fact that a large percentage of the retail butchers will not handle a pig over 100lbs. Buyers are therefore hesitant to purchase at this weight; at the same time such pigs cannot be properly classed as baconers.

The Baconer.—The pig should be clean, well dehaired, and as near white finished carcasses as possible. The skin should be smooth and free from coarse wrinkles. The hams should be long, wide, and full of meat right down to the hocks, with short and fine leg bones. The backs should be a good length, also broad and full of flesh, with a high proportion of lean meat to fat. They should have long level sides tapering to proportionately light shoulders, the shoulders being compact with the blade bones well set in, with a small neck and fine short-boned front legs. The size of the head should be in proportion to the weight of the carcass, the smaller the better at all times, the whole having the effect of a light fore-end. The fat should be white, firm, and not oily, and only moderate in proportion to lean, so that trimming is avoided when the carcasses are cut. The bellies should be well streaked with lean meat, with not an excess of leaf fat.

The general public dislikes too much fat in pork, bacon, and ham because of waste. What fat there is must be firm and not oily.

With these definitions in mind the criticisms of the various carcasses can be better understood.

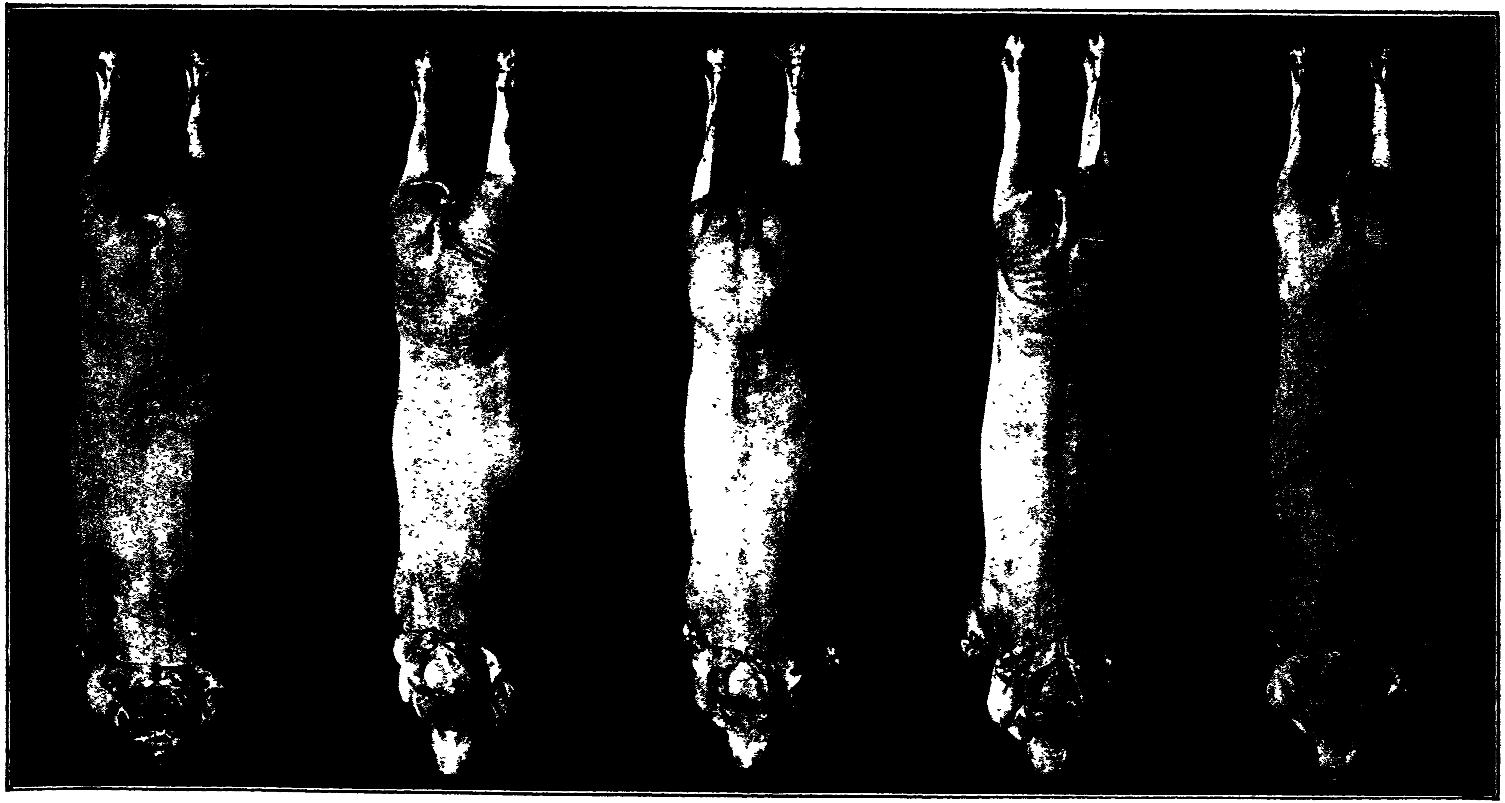
CRITICISM OF CARCASSES.

Lot 1.—Barley.

Berkshire K61	Local:	Wonderful hams, otherwise too short and fat for trade purposes.
	London:	Very good pig of the type, with very good hams, but no length in the loins and very heavy in the shoulder, generally speaking too fat and wasteful for the trade.
Large White x Berkshire	Slaughtered on the farm.	
Large White x Berkshire K63	Local:	Good porker, conformation and quality right, also carrying a clean, white skin.
	London:	Satisfactory.
Tamworth x Berkshire 249	Local:	Conformation and quality right, skin showing black patches and badly marked from fighting.
	London:	Good hams, rather wasteful and heavy in the shoulder, would cut too fat.
Large White x Mid York K60	Local:	Good bacon pig, nice length of middle, skin clear and white.
	London:	Satisfactory, but a little wasteful.
Large White x Tamworth x Berkshire K62	Local:	Conformation and quality right, skin showing mottles down the back.
	London:	Very good quality and conformation, but inclined to be a little too fat.

Lot 2.—Barley and Meatmeal, 100-5.

Berkshire 250	Local:	Good hams, otherwise very coarse, showing a bad skin.
	Disposed of Locally.	
Large White x Berkshire 389	Local:	Conformation and quality right, skin showing a very high colour.
	London:	Very good baconer, inclined to be a little wasteful.
Large White x Berkshire 390	Local:	Conformation and quality right, badly marked through fighting.
	London:	Good baconer, altogether satisfactory.
Tamworth x Berkshire B69	Local:	Conformation and quality right, but showing a very bad skin, brown patches practically all over the carcass, especially hams.
	London:	Satisfactory.
Large White x Mid-York 388	Local:	Conformation and qaulity good, but skin showing red down back and on flanks, marked with fighting.
	London:	Very satisfactory type of baconer.
Large White x Tamworth x Berkshire	Slaughtered on the farm.	



SPECIMENS OF THE 31 CARCASSES SENT TO LONDON FOR CRITICISM IN CONNECTION WITH THESE EXPERIMENTS

1 Old-time Australian Berkshire—unsuitable for export. 2, 3, 4, 5—Long, narrow types (Large White and Tamworth) were used as sires, and the short, thick types (Berkshire and Mid York) as dams.

2. Large White–Berkshire. 3. Tamworth–Berkshire 4. Large White-Mid York. 5. Large White on Tamworth–Berkshire.

Lot 3.—Barley, Skim Milk, and Lucerne, 100-100-25.

Berkshire 240	Local:	Showing good hams, otherwise coarse, especially shoulders and jowl, carcass too fat and skin rough.
	London:	True to type of pure Berkshire, having very good hams, but cannot be classed as good baconers in the United Kingdom, too short in the back and too wide, too heavy in the fore ends, and would cut far too wasteful.
Large White x Berkshire 239	Local:	Good conformation, but skin showing small haemorrhagic spots over the carcass.
	London:	Very good baconer, inclined to be a little wasteful, better in this respect than 389, fed barley and meatmeal.
Large White x Berkshire 243	Local:	Nice light baconer, showing good conformation and quality right, skin showing slight haemorrhage.
	London:	Excellent quality, suitable for United Kingdom trade, conformation and condition good.
Tamworth x Berkshire 232	Local:	Good hams and length of loin, rather fat, skin very bright.
	London:	Satisfactory throughout, not too wasteful.
Large White x Mid-York 242	Local:	Ideal bacon pig, good ham, nice length of loin, quality good, not too fat, good skin.
	London:	Very good type of baconer, not too wasteful.
Large White x Tamworth x Berkshire 238	Local:	Good conformation, but showing a poor skin, black patches and red blotches on back and shoulders.
	London:	Satisfactory type of baconer.

Lot 4.—Wheat.

Berkshire	Slaughtered on the farm.	
Large White x Berkshire K64	Local:	Light bacon pig, conformation and quality good, showing a very bright white skin.
	London:	Good conformation and quality, inclined to be a little too fat.
Large White x Berkshire K65	Local:	Light bacon pig, conformation and quality good, showing a very bright and white skin.
	London:	Good conformation and quality, inclined to be a little fat.
Tamworth x Berkshire 391	Local:	Good bacon pig, showing dark patches characteristic of this cross, no red discolouration.
	London:	Very good baconer, not too heavy in the fore ends and not wasteful, showing a fair amount of Tamworth strain in length of lean meat.
Large White x Mid-York 392	Local:	Nice bacon pig, but carrying a high colour.
	London:	Satisfactory bacon pig.
Large White x Tamworth x Berkshire K66	Local:	Good porker, skin showing a slight red blemish on the forequarter.
	London:	Excellent quality, very suitable for United Kingdom trade, conformation and quality very good.

Lot 5.—Wheat and Meatmeal, 100-5.

Berkshire 248	Local:	Excellent hams, quality too fat and very rugged in the fores, too much jowl.
	London:	Excellent pig of the pure Berkshire, very good hams, but cannot be classed as a good baconer in the United Kingdom, too short in the back and too wide, too heavy in the fore ends, and would cut far too wasteful.
Large White x Berkshire 244	Local:	Showing good hams, good loins, rugged in the fores, jowl prominent, skin showing red blemish down the back.
	London:	Very good baconer, inclined to be a little too wasteful.
Large White x Berkshire 245	Local:	Good conformation and quality, jowl slightly prominent, a very white, clear skin.
	London:	Good baconer, altogether satisfactory.
Tamworth x Berkshire 247	Local:	Good quality, fair conformation, skin showing brown patches on hams and flanks.
	London:	Satisfactory type of baconer.
Large White x Mid-York 237	Local:	Nice carcass, showing good conformation, jowl prominent, skin very bright and clear.
	London:	Satisfactory type of baconer.

Lot 5—*continued.*

Large White x Tamworth x Berkshire 246	Local:	Good conformation and quality, skin showing red blotches down the back.
		Disposed of locally.

Lot 6.—Wheat, Skim Milk, and Lucerne, 100-100-25.

Berkshire 241	Local:	Wonderful hams, otherwise too short and thick for bacon.
	London:	Excellent pig, true to type of the pure Berkshire, very good hams, but to be classed as a good baconer in the United Kingdom, is too short in the back and too wide, too heavy in the fore ends, with cuts far too wasteful.
Large White x Berkshire 234	Local:	Showing good hams and long loins, skin very bright, but carcass too fat and showing too much jowl.
	London:	Of nice quality, with good conformation, not too wasteful, a good type.
Large White x Berkshire 233	Local:	Conformation good, but carrying too much belly fat, skin showing small red spots on loin and shoulder.
	London:	Very good baconer, but inclined to be a little wasteful, but better than Large White x Berkshire fed wheat and meatmeal.
Tamworth x Berkshire 236	Local:	A good bacon pig, showing good hams, a long loin, not too fat, but skin showing small haemorrhagic spots.
	London:	Very good baconer, not too heavy in the fore ends, showing a fair amount of Tamworth strain in length of lean meat.
Large White x Mid-York 231	Local:	Good hams, long loins, skin rather red, excess of fat along the back, especially at the flanks.
	London:	Satisfactory type of baconer.
Large White x Tamworth x Berkshire 235	Local:	Good hams, nice length of loin, skin showing a very high colour, jowl prominent, carrying excess of belly fat.
	London :	Satisfactory type of baconer.

CLASSIFICATION OF PIGS EXPORTED.

Berkshire.—Four pigs exported. These were criticised, both in South Australia and England, as being unsuitable for trade purposes, being heavy at the shoulder and too short and thick in body; they were also far too wasteful when cut up. Otherwise they were described as having excellent hams.

Large White x *Berkshire.*—Eleven pigs exported. One of these reared on barley, skim milk, and lucerne was classed as excellent, complying with all characteristics that go towards an ideal type. Four pigs were classed as very good and satisfactory, being of good conformation and not wasteful when cut up; these were reared on barley, barley and meatmeal, wheat and meatmeal, and wheat, skim milk, and lucerne respectively. Six pigs were classed as very good, but a little wasteful; although of good conformation they were carrying a little too much condition in various parts of the body, particularly the shoulders and head; in this case the pigs were fed barley and meatmeal, barley, skim milk and lucerne, wheat and meatmeal, wheat, skim milk and lucerne, and two wheat alone.

Tamworth x *Berkshire.*—Six pigs exported. Five of these were classed as very good and satisfactory, having long bodies, good hams, and light forequarters. The pig fed on barley, although classified as good, was too heavy in the shoulder and would cut too fat.

Large White x *Mid-York.*—Six pigs exported. Five of these were classed as very good and satisfactory; the pig fed on barley, very good conformation but a little wasteful in cutting up.

Large White x *Tamworth* x *Berkshire.*—Four pigs exported. One of these fed on wheat was classed as excellent, being light in the shoulder, long in the body, good hams, and would cut up without waste; two, one of which was fed on barley, skim milk, and lucerne, and the other on wheat, skim milk, and lucerne, were described as very good and satisfactory; and the pig fed on barley, as very good, but a little wasteful.

IN CONCLUSION.

Although the final figures of the feeding test give considerable information and subject for thought, the termination of the trial before all pigs had reached a bacon weight has introduced one or two debatable points, the figures not being sufficiently complete to make a true comparison possible in all cases, and due allowance should be made when comparisons are attempted.

In the groups fed barley, barley and meatmeal, and wheat, 3, 2, and 4 pigs respectively completed their feeding while still short of the desired weight. Had feeding continued with the same rate of increase per individual, a further seven to eight weeks would have elapsed before the last pig would have reached 160lbs. live weight; by terminating the test early the pigs in three pens referred to show slightly higher returns than would otherwise be the case.

The sample of barley used during the test was of rather poor quality, the grain being shrivelled and carrying a fairly high percentage of fibre, with the result that final figures were somewhat misleading. For comparison a further series of feeding trials has been instituted on somewhat similar lines, using a better quality grain, and no doubt results will show to advantage over the present series.

DEDUCTIONS.

1. In the feeding of pigs, rations balanced by the addition of appetising foods return greater gains than those that are unbalanced, dry and unpalatable, as shown by the supplementing of grain with skim milk and lucerne.

2. Meatmeal can be fed to advantage with wheat; with barley, results were disappointing. It was expected that by improving the protein content final figures would have been somewhat in the same proportion as meatmeal and wheat, particularly as barley showed to greater advantage than wheat when fed alone.

3. The amount of food, in terms of "dry matter," consumed per day increases with the palatable nature of the ration, but decreases in quantity required to produce 1lb. of increase.

4. The use of supplementary foods increases the value of food consumed per day, but with one exception, meatmeal and barley, decreases the cost of producing 1lb. of pork.

5. With pork at 5½d. per lb., the mean value of increase per pig over food consumed is as follows:—Barley, 10s. 8¾d.; barley and meatmeal, 10s. 0¼d.; barley, skim milk, and lucerne, 16s. 6½d.; wheat, 14s.; wheat and meatmeal, 18s. 1d.; and wheat, skim milk, and lucerne, 21s. 6½d.

6. With pork at 5½d. per lb., barley fed to pigs alone, with meatmeal, and with skim milk and lucerne, would be worth respectively 2s. 10¾d., 2s. 7½d., and 3s. 9¼d. per bushel; whereas wheat fed in similar manner would be worth 3s. 10½d., 4s. 7d., and 5s. 5½d. per bushel.

7. The mean difference of 29.09 per cent. between live weight on the farm and cold dressed weight represents very closely the recognised 30 per cent. loss in dressing.

8. Local and overseas authorities agree on the main characteristics of type, namely, light fore-ends, long bodies, and well developed hams; the greatest fault is the carrying of excess fat, particularly at the shoulder and along the back, for the reason that it is too wasteful when cut into joints or pieces.

9. Conformation of the ham is important in pigs for export, a characteristic that is not very often associated with the long lean breeds, as the Large White and Tamworth.

10. Colour of carcass, though important, is not stressed by the London critic, beyond stating they should be well dehaired and as near white as possible. This may be due to the fact that bacon, and not pork, types were under review.

By careful attention to breeding pigs light in shoulder, long in the bodies, and well-developed hams, and the judicious use of palatable and nutritious supplements to barley and wheat such as skim milk and lucerne, and to a lesser extent meatmeal, economic results can be obtained on the export market.

SEED WHEAT FROM CROP COMPETITIONS.

In Wheat Crop Competitions, conducted in the undermentioned Districts the following Competitors exhibited crops which, in the opinion of the Judge at the time of inspection, should produce grain suitable for seed purposes.

District. Competitor. Address. Variety.

MIDLANDS—

P. McD. Smyth, Salter's Spring—Marathon, Dundee.
C. J. Lake, Owen—Ford.
J. S. Lake, Owen—Ford, Marathon.
C. J. H. Behn, Riverton—Dundee, Baringa, Ghurka, Waratah.
G. Hazel, Kapunda—Ranee 4H.
Hughes Bros., Kapunda—Ranee 4H.
L. V. Bell, Marrabel—Ranee 4H.
J. F. Riechelt, Tarnma—Dundee, Carrabin.
D. H. Campbell, Buchanan—Ranee, Sword.
Gask Bros., Gum Creek—Carrabin, S.H.J.
L. F. Thomas, Hallett—Gallipoli.
R. L. Slugget, Hill River—Dan.
D. & J. Kelly, Giles' Corner—Dundee.
Molineux Bros., Tarlee—Sword.
A. G. Kirk, Farrell's Flat—Mogul, Sword.
L. A. Martin, Farrell's Flat—Dundee.
G. Klem, Farrell's Flat—Dundee, Mogul.
S. Garrard, Mintaro—Gallipoli.
J. Garrard, Farrell's Flat—Ranee, Dan, Gallipoli.
J. H. Torr, Farrell's Flat—Dundee, Mogul.
Miller Bros., Farrell's Flat—Gallipoli, Ranee.
R. F. Kelly, Manoora—Ranee 4H.
H. Schunke, Manoora—Gallipoli.
T. W. Allen, Auburn—Dundee, Ghurka.
J. Ross, Mintaro—Sword, Waratah.
R. Blatchford, Mintaro—Dundee, Ranee 4H.
W. Woods & Sons, Wirrilla—Dundee.
A. J. Jones, Manoora—Gallipoli.
P. C. Schnaitmann, Saddleworth—Waratah, King's White.
F. Coleman, Saddleworth—Dundee, Ranee 4H, Ghurka.

CHANDOS—

E. S. Ross, Parrakie—Sword.
P. Ross, Parrakie—Sword.
A. Y Knight, Geranium—Sword.
R. A. Haman, Lameroo—Sword.
H. Hunt, Geranium—Sword.
W. H. Cabot, Parrakie—Sword.
H. E. Vogt, Pinnaroo—Sword.
Mattiske Bros, Pinnaroo—Ranee 4H.
A. H. Edwards, Pinnaroo—Sword.
H. F. Johnson, Parilla—Waratah.
J. L. Koch, Lameroo—Waratah.
A. J. A. Koch, Lameroo—Bencubbin.
H. M. Symon, Pinnaroo—Ghurka.
F. S. Traeger, Pinnaroo—Nabawa.

SEED WHEAT.—*Continued*

District. Competitor. Address. Variety.

SOUTHERN YORKE PENINSULA—
W. H. and J. Alderman, Minlaton—Sword.
N. H. Boundy, Minlaton—Ford.
H. Polkinghorne, Minlaton—Sword.
A. J. Short, Curramulka—Bobin.
O. H. Bittner, Curramulka—Bencubbin.

MID YORKE PENINSULA—
E. F. Heinrich, South Kilkerran—Dan.
O. B. Linke, South Kilkerran—Ford.
S. W. H. Heinrich, South Kilkerran—Geeralying, Sword.
J. C. A. Arnold, South Kilkerran—Sword.

LE HUNTE—
P. P. Cook, Mount Damper—Ford.
J. Christian, Yaninee—Nabawa.
S. C. Billinghurst, Minnipa—Ford, Merridin.
G. Williams, Minnipa—Merridin.
A. Shepherd, Wudinna—Sword.

CENTRAL—
H. and M. Wehr, Freeling—Nabawa.
L. George, Wasleys—Sword.
W. H. Aldridge, Gawler River—Sword.
Messrs. Dawkins and Aunger, Gawler River—Sword.
H. J. Griffiths, Salisbury—Dundee.
G. Heinjus, Sheoak Log—Sword.

NORTHERN YORKE PENINSULA—
M. D. Wright, Cunliffe—Sword.
Mrs. J. H. Bussenchutt, Paskeville—Sword.
G. E. and H. M. Meier, Paskeville—Sword, Waratah, Bencubbin, Dundee.
J. S. Henderson, Arthurton—Sword and Ford.
R. S. Bussenchutt, Paskeville—Dundee.
Yelland Bros., Paskeville—Ranee 4H.

BALAKLAVA—
E. Baker, Barabba—Nabawa.
W. J. Marshman, Owen—Nabawa and Sword.
D. J. Wilson, Barabba—Ford.
Bowyer Bros., Owen—Ford.
Harkness Bros., Owen—Sword.
J. D. Campbell, Barabba—Sword.
A. N. and H. M. Freebairn, Owen—Sword.
Sorrell Bros., Barabba—Sword.

ALFRED—
G. E. Hyde, Paruna—Nabawa, Ranee 4H, Sword.
N. C. Webb, Paruna—Sword, Nabawa.
D. and H. Kretschmer, Paruna—Nabawa.
E. M. Edwards, Paruna—Ranee 4H.
G. J. Zimmermann, Meribah—Caliph, Nabawa.
P. Paull, Alawoona—Ranee 4H.
A. Fisher, Noora—Sword.

SEED WHEAT.—*Continued.*

District. Competitor. Address. Variety.

ALBERT—

E. A. Kroehn, Nildottie—Nabawa.
A. E. Horstmann, Netherleigh—Bencubbin.
J. W. G. Mann, Mindarie—Sword.
H. Bird, Halidon—Sword.
G. H. Sutherland, Copeville—Ranee 4H.
A. G. W. Grant, Sandalwood—Sword.

BUXTON—

C. G. and G. W. Cant, Kimba—Ranee 4H.
J. E. Beinke, Kimba—Gluyas.

JERVOIS—

W. C. McCallum, Arno Bay—Sword.
M. H. Burton, Rudall—Waratah.
D. C. McCallum, Rudall—Waratah.
F. H. Brine, Miltalie—Waratah.
T. L. Badman, Miltalie—Ranee.
J. C. Sims, Cleve—Waratah.

NORTHERN—

J. E. Lehmann, Caltowie—Bencubbin and Totadgin.
W. S Adams, c/o Misses McLeod, Jamestown—Ranee 4H.
W. Keding, Belalie North—Turvey.
C E. Keller, Wirrabara - Ford.
J. Knauerhase, Laura—Ford.
J W. Prior, Gladstone Ranee 4H, Sword, Ford.
A. D. Bray, Belalie North—Dundee.
N W. Royal, Caltowie- Sword.
E. Symonds, Caltowie—Ford.
T. Cockburn, Wirrabara- Ranee.

MIDDLE NORTH—

J. L. Noonan, Gulnare- Sword and Nabawa.
E. Smart, Gulnare—Nabawa.
J. T. Clothier, Redhill—Sword and Ranee 4H.
Spencer Bros., Koolunga—Dundee and Warden's.
A. Maitland, Rochester—Ranee 4H, Nabawa.
W. G. Darmody, Rochester, Ranee 4H, Nabawa.
W. R. R. Simon, Halbury—Sword.
W. Ryan, Halbury—Sword.

SOUTHERN—

H. B. Scheer, Mannum—Sword.
A. C. Bormann, Millendilla—Sword.
A. E. Wegener, Millendilla—Sword.
V. W. Eichler, Mannum—Sword.
W. R. Pese, Mannum—Sword.
Wachtel Bros., Palmer—Sword.
H. Wachtel, Palmer—Sword.
L. Wachtel, Palmer—Sword.
C. S. E. Paech, Tepko—Sword.
L. A. Krause, Palmer—Sword.
H. A. Krause, Palmer—Sword.
G. W. Faehrmann, Palmer—Sword.
S. A. Bretog, Mannum—Sword.
B. R. W. Lindner, Mannum—Sword.

SEED WHEAT.—*Continued.*

District. Competitor. Address. Variety.

SOUTHERN—*continued*—

Frahn Bros., Monarto—Sword.
Hugo Paech, Rockleigh—Dundee, Bencubbin, Sword.
C. F. Altmann, Monarto South— Ranee.
Thomas Bros., Monarto South—Sword.
J. J. Hartmann, Monarto South—Waratah.
E. E. Libelt, Monarto South—Nabawa.
W. H. Schubert, Brinkley—Sword.
E. W. Pearson & Sons, Brinkley—Sword.
G. Cross, Belvidere—Sword.
Rankine Bros., Strathalbyn—Baringa.
A. B. Jaensch, Hartley—Nabawa.
E. and T. Jaensch, Hartley--Ford, Sword, Bencubbin.
H. H. Cross, Woodchester—Sword, Ford.

FLINDERS—

G. & A. Lawrie, Ungarra.—Ford.
P. H. Wagner, Brimpton Lake.—Ford.
M. Aikenhead, Brimpton Lake.—Nabawa, Sword.

FAR NORTHERN—

W. G. Gregurke, Wepowie—Ranee 4H.
T. F. Orrock, Wepowie—Dundee.
J. G. Crocker, Wepowie—Ranee 4H.
E. W. E. Paech, Box 89, Orroroo—Nabawa.
E H. Hampel, Terka—Ranee 4H and Sword.

TATIARA—

E. J. Buckley, Bordertown—Gallipoli.
R. A. Grosser, Wolseley—Gallipoli.
Fisher Bros., Bordertown—Ghurka, Ranee 4H.
D. R. Milne, Bordertown—Ghurka, Ranee 4H.
A. E. England, Bordertown—Bencubbin.
J. D. Mayes, Wolseley—Bencubbin, Federation.
H. C. M. Pilgrim, Wolseley—Ranee 4H.

OATS.

C. Rodda, Thrington—Guyra and Mulga.
T. Rodda, Thrington—Early Kherson.
G. E. and H. M. Meier, Paskeville—Palestine, Early Kherson.
C. J. H. Behn, Riverton—Imbros Is., Algerian, Calcutta Cape.
Geo. Hazel, Kapunda—Calcutta Cape.
Hughes Bros., Kapunda—White Essex.
F. Coleman, Saddleworth—Algerian, Calcutta Cape.
R. H. Grosser, Wolseley—Algerian.
A. H. Allen, Mount Gambier—Algerian.
C. T. Mitchell, Mount Gambier—Algerian.
L. & H. Patzel, Mount Gambier—Algerian.
F. W. Button, Mount Gambier—Algerian.
H. Walsgott, Mount Gambier—Mulga.

BARLEY.

W. K. Oliver, Wasleys—Prior.
T. Rodda, Thrington—Prior.
Norman Bros., Mount Gambier—Plumage.
A. H. Allen, Mount Gambier—Plumage.

ANNUAL REPORT ON PASTURE WORK, KYBYBOLITE, 1934-35.

[By L. J. Cook, R.D.A., Manager.]

Another comparatively good pasture season was experienced during 1934-35, and of 602 acres of fields and plots that have been used as pasture during recent seasons, 324 acres (54 per cent.) of them recorded increased carrying capacity over the previous season, and the majority of the other fields exceeded the average for the past seven seasons. Consequently a further small increased number of livestock was carried on the Farm for the year, and approximately 100 acres of pasture were mown and conserved as ensilage or hay, yielding an increased conservation of 60 tons of each class of fodder.

Throughout the agricultural year—1st April, 1934, to 31st March, 1935—an average of 1,646 sheep and 145 cattle has been kept, as against 1,626 sheep and 143 cattle during the previous 12 months, showing an increase of 20 sheep and 2 cattle. 192 acres of temporary pasture were available during the season, and 113 acres were sown to crops. Hence 794 acres of pasture, with the stubble feed of 113 acres, have provided feed for 1,646 sheep, and 83 head of growing cattle wholly throughout the season, as well as full pasturage for 48 milking cows during the pasture growing period, and portion of their feed during the balance of the year. Also 24 horses have had part-time grazing. Besides the above grazing 140 tons pasture growths were made into silage, and 82 tons meadow hay were made and stored from various fields. 130 acres of the general pasture fields were not top dressed this season, whilst 286 acres of these pasture fields received 90lbs. 45 per cent. superphosphate per acre.

Well grazed *Phalaris tuberosa* and Subterranean Clover pasture on its fifth season of growth.

THE SEASON.

A splendid opening rain of 1½in. was received during the first few days of April, and this was followed by a further 1½in. distributed over the second and third weeks of that month, which caused a first-class germination and a quick early growth of pasture plants. This opening was followed by an unusually dry winter, only 8 points being received in May, and 57 points in June, which naturally checked growth of plants. However, well fertilised pastures responded so well to the early rains that sufficient grazing was available for all stock, and hand-feeding was not required. Moreover, it ensured good sweet short pastures during this period, and consequently good health amongst the stock. Very useful rains were received in July, ¾in. less than the average, and August rains were ½in. below average, which allowed pasture plants to maintain healthy growth, without practically any saturated conditions. The September, October, and November rains were really good, registering more than 2in. above the average for the spring, and caused a very fine finish to the pastures. On account of the somewhat late start of these spring flush growths, the growths of Subterannean Clover, although sweet and fairly well matured, were not as bulky as usual. Consequently yields of ensilage and meadow hay were not as heavy as other years, but some very fine quality fodders were conserved. The summer rains were below average, but ample paddock feed was available to stock until the break in the 1935 season occurred in mid-March.

The following table shows the monthly rainfall of recent years, compared with the average for the past 29 seasons:—

	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1906-34.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
April	2·10	0·20	1·50	3·12	1·15	1·98	2·32	2·32	2·97	1·41
May	3·17	2·92	2·24	2 16	1·39	2·54	0·86	4·97	0·08	2·47
June	1·24	1·63	2·53	3·32	0·34	3·40	3·38	0·93	0·57	2·65
July	2·71	2·14	2·71	3·08	4·34	2·52	2·46	0·93	1·97	2·80
August	3·31	4·02	0·90	1·84	3·65	2·32	2·48	2·79	2·13	2·63
September	1·79	0·91	3·12	1·75	2·95	1·85	1·39	3·65	2·98	2·65
October	2·27	0·52	4·47	1·50	2·55	0·47	1·58	1·05	3·36	1·90
November	0·68	2·06	0·99	0·97	0·93	0·38	0·59	3·90	1·87	1·48
December	0·83	1·31	0·17	1·66	2·94	0·06	0·74	0·79	0·46	1·10
	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	
January	0·51	1·59	1·35	0·02	1·59	0·02	1·03	0·42	0·82	0·55
February	1·20	1·74	0·22	1·57	0·10	1·92	0·02	0·19	0·18	0·95
March	0·96	0·55	0·65	0·06	0·98	2·11	1·12	0·36	2·88	0·96
Total	20·77	19·59	20·85	21·05	22·91	19·57	17·97	22·30	20·27	21 56

IMPROVEMENT OF NATURAL PASTURES WITHOUT CULTIVATION.

The work of top dressing natural pastures with phosphatic fertilisers and lime, that was commenced in 1919, is being continued on 13 plots of 3½ acres to 5 acres each in area. Grazing records have been kept since 1921, and for the past six seasons the plots have been continuously grazed in rotation by four flocks, constituted according to the estimated carrying capacity, and a separate flock has been used for each type of fertilised pasture. For five seasons Waite Institute wethers were used in conjunction with Kybybolite Comeback ewes in these flocks, but the wethers were removed at the end of 1933, and for this season additional Comeback ewe hoggets were utilised with the original (1928 drop) ewes in the flocks. This year A flock, consisting of 13 ewes, grazed on 13½ acres of unmanured land; B flock, of 44 ewes, grazed on the 14 acres of land improved with Superphosphate; C flock, of 60 ewes, grazed on the 17 acres of land improved with Lime and Superphosphate; and D flock, of 21 ewes, grazed on the 10½ acres of land improved with Rock Phosphate fertiliser. Another small flock has been used on all fertilised plots as required to utilise excess feed. Monthly weighings of ewes have been taken, so that a definite record of their development on this type of pasture is available.

The botanical analysis of these pastures was continued, and once per month throughout the growing period percentage estimations were made by taking six indiscriminate quadrat readings over each plot.

The following table shows the fertiliser applied, with date and rate of applications, whilst Table 3 shows the grazing results secured since 1921:—

TABLE 2.—*Fertilising of Natural Grazing Test, Kybybolite,* 1919-35.

Plot.	Total Fertiliser per Acre.	Date and Rate of Application.
6	No manure (check plot)	—
12	No manure (check plot)	—
1	1 ton Aluminium Phosphate Rock (412lbs. Phos. acid)	1919, one application.
4	11cwts. Calcium Phosphate Rock (232lbs. Phos. acid)	1919, one application.
	6cwts. Calcium Phosphate Rock (127lbs. Phos. acid)	1920-25, 1cwt. per annum.
	4½cwts. 82% Calcium Phosphate Rock (189lbs. Phos. acid)	1926-34, ½cwt. per annum.
5	1 ton Calcium Phosphate Rock (422lbs. Phos. acid)	1919, one application.
	10cwts. Calcium Phosphate Rock (420lbs. Phos. acid)	1929, one application.
11	6cwts. Ephos. Phosphate (188lbs. Phos. acid)	1924, one application.
2	11cwts. Aluminium Phos. Rock (227lbs. Phos. acid)	1919, one application.
	6cwts. Aluminium Phos. Rock (124lbs. Phos. acid)	1920-25, 1cwt. per annum.
	459lbs. 45% Superphosphate (94lbs. Phos acid)	1926-34, 51lbs. per annum.
7	990lbs. 45% Superphosphate (203lbs. Phos. acid)	1924-34, 90lbs. per annum.
8	1,620lbs. 45% Superphosphate (334lbs. Phos. acid)	1926-34, 180lbs. per annum.
3	1 ton Lime (Calcium carbonate)	1919, one application.
	1 ton Lime (Calcium carbonate)	1929, one application.
	1,770lbs. 36% Superphosphate (296lbs. Phos. acid)	1919-34, 1cwt. per annum.
10	1 ton Lime (Calcium Carbonate)	1924, one application.
	1,210lbs. 45% Superphosphate (249lbs. Phos. acid)	1924-34, 1cwt. per annum.
9	1 ton Gypsum (Calcium sulphate)	1926, one application
	986lbs. 45% Superphosphate (203lbs. Phos. acid)	1926-34, 1cwt. per annum.
13	1 ton crushed Limestone (Calcium carbonate)	1926, one application.
	986lbs. 45% Superphosphate (203lbs. Phos. acid)	1926-34, 1cwt. per annum.

TABLE 3.—*Returns of Natural Grazing Test, Kybybolite,* 1921-35.

Grazing (in Sheep per Acre.)

Year.	Check Plots.		Rock Phosphate Plots.			Plot 11.	Superphosphate Plots.			Lime and Super Plots.			Gypsum and Super. Plot 9.
	Plot 6.	Plot 12.	Plot 1.	Plot 4.	Plot 5.		Plot. 2.	Plot 7.	Plot 8.	Plot 3.	Plot 10.	Plot 13.	
1921-22	1·11	—	1·52	1·48	1·33	—	1·64	—	—	1·84	—	—	—
1922-23	0·83	—	1·47	1·20	1·27	—	1·41	—	—	2·06	—	—	—
1923-24	0·80	—	1·91	1·33	1·53	—	1·31	—	—	2·50	—	—	—
1924-25	1·36	—	2·72	3·00	3·05	—	2·73	—	—	4·25	—	—	—
1925-26	0·71	0·81	1·64	1·78	1·71	1·27	1·58	1·13	—	2·92	1·54	—	—
1926-27	0·56	0·99	1·84	1·59	1·84	1·67	1·66	1·91	1·27	3·81	1·78	1·99	0·98
1927-28	0·68	0·97	1·95	1·74	1·98	1·89	1·98	1·79	1·34	2·58	2·16	1·86	1·50
1928-29	0·66	0·58	1·61	2·24	2·30	2·17	2·63	2·42	2·06	3·24	3·60	2·54	2·08
1929-30	0·86	1·05	1·11	1·38	1·62	1·85	2·40	2·36	2·15	3·73	2·42	2·52	1·95
1930-31	0·82	1·28	1·84	1·94	2·11	2·34	2·83	3·02	3·80	3·65	3·47	3·39	3·33
1931-32	0·82	1·25	1·58	2·04	2·71	2·33	3·26	3·79	3·99	3·60	2·92	3·31	3·63
1932-33	0·64	1·33	1·64	2·48	2·27	2·67	3·05	3·83	3·87	3·63	3·33	3·82	3·47
1933-34	0·71	0·98	1·44	2·63	2·77	1·96	3·51	3·58	4·26	4·59	2·90	3·83	3·84
1934-35	0·86	1·01	1·82	2·25	2·57	2·81	3·76	4·81	5·72	4·42	3·60	5·14	4·71
Means—													
1921-34	0·82	—	1·72	1·93	2·08	—	2·41	—	—	3·34	—	—	—
1926-34	0·73	1·05	1·65	2·03	2·24	2·19	2·79	3·06	3·16	3·69	2·91	3·16	2·78
	0·89			2·13			3·00			3·25			
Increase above no manure—													
14-year average			0·90	1·11	1·26	—	1·59	—	—	2·52	—	—	—
9-year average			0·76	1·14	1·35	1·30	1·90	2·17	2·27	2·80	2·02	2·27	1·89
				1·24			2·11			2·36			
Increase above rock phosphate dressed plots—													
9-year average			—	—	—	—	0·56	0·93	1·03	1·56	0·78	1·03	0·65
							0·87			1·12			
Increase above superphosphate dressed plots—													
9-year average			—	—	—	—	—	—	—	0·69	—	0·16	—
										0·25			

The results show much higher returns than usual, and indicate that the season was very suitable for this type of pasture. No excess moisture being present in the winter allowed the plants to maintain healthy growth throughout, resulting in exceptionally high grazing from the well-fertilised plots. The average return from all fertilised plots in the series has been 3.79 sheep per acre for the season, which is the highest return so far received and is 1¼ sheep per acre above the average secured for the past 14 seasons.

Six individual plots yielded their best return since commencement. No 8, fertilised annually with 180lbs. 45 per cent. superphosphate, carried 5.72 sheep per acre, which is more than 1 sheep greater than any area of this type of pasture in previous seasons. This is the ninth season in which the superphosphate has been applied, and it carried a particularly healthy and vigorous pasture throughout the season. For the immediate past five seasons this plot has averaged over 4¼ sheep per acre per annum, illustrating clearly the advantage of maintaining the top dressing with superphosphate, and the futility of ceasing to top dress after the third or fourth application. Plot No. 13, top dressed with crushed limestone in 1926 and 1cwt. 45 per cent. superphosphate annually, also carried over 5 sheep (5.14) per acre for the season, an increase of 1¼ sheep on the previous season. Plot No. 7, dressed with 90lbs. 45 per cent. superphosphate annually, was next in order of productivity with 4.81 sheep per acre, and exceeded its previous highest return by 1 sheep. For the last five seasons this plot has averaged 3.80 sheep per acre, just ½ sheep less than No. 8 with the heavier application. Plot No. 9, dressed with gypsum and superphosphate, with 4.71 sheep per acre, also exceeded its previous best year by 1 sheep. Plot No. 2, dressed with 51lbs. superphosphate, with 3.76 sheep per acre, yielded ¼ sheep better than in 1933-34, whilst Plot No. 11, dressed with Ephos phosphate in 1924, yielded 2.81 sheep, which was a little better than its previous best in 1932-33. Plot No. 3 dressed with lime and superphosphate also carried 4.42 sheep per acre for the season, only slightly less than it did the previous year. This plot has averaged 4 sheep per acre for the past five seasons, a little greater yield than Plot No. 7, which has received the same annual application of superphosphate, but without the lime.

For this season the three plots dressed with lime and superphosphate have averaged 4.38 sheep per acre, and the three plots dressed only with superphosphate have averaged 4.76 sheep, showing 0.38 sheep per acre in favour of superphosphate without the lime, whilst the two plots, that have received continued applications of rock phosphate carried 2.41 sheep, quite 2 sheep per acre less.

The same plots (averaged over the immediate past nine seasons) have carried 3.25, 3, and 2.13 sheep per acre per annum respectively, showing an increase of 0.25 (8 per cent.) sheep for lime and superphosphate over superphosphate only; 1.12 (52 per cent.) sheep for lime and superphosphate over rock phosphate; and 0.87 (41 per cent.) sheep for superphosphate over rock phosphate.

Compared with the check plots (no manure) the same three series of plots have shown increases of 2.36 (265 per cent.), 2.11 (237 per cent.), and 1.24 (139 per cent.) sheep per acre per annum for the nine seasons.

It is to be noted that the plots dressed only with superphosphate have become quite as productive during recent years as those dressed with lime and superphosphate, and both series have advanced considerably in production. Rock phosphate dressed plots, however, have not made much improvement, and maintain a production much less than the former two series.

In the following table the average of all plots for the past nine seasons have been grouped together according to the various forms of fertiliser, and shows an interesting comparison of returns and value:-

NATURAL PASTURE.

TABLE 4.—*Comparative Summary of Nine Years Grazing on Topdressed Natural Pasture.*

Fertilisers Applied.	Area.	Sheep per Acre.	Increase over No-Manure.	Increase over Super-phosphate.	Increase over Rock Phosphate	Annual Cost of Fertiliser per Acre.	Annual Cost of Fertiliser per Sheep.	Profit per Acre per Annum, Sheep. at 15s.
	Acres.		%	%	%	*s d.*	*s. d.*	*s. d.*
Lime and Superphosphate (W.S.P.)	8½	3·30	271	10	55	9 6	3 11	26 8
Crushed Limestone and Superphosphate (W.S.P.)..	5	3·16	255	5·3	48	8 3	3 8	25 9
Superphosphate (W.S.P.)	10½	3·00	237	—	41	5 5	2 7	26 3
Gypsum and Superphosphate (W.S.P.)	3½	2·78	212	—	31	9 6	5 0	18 10
Ephos Phosphate (Cit. and Acid Sol. Phos.)	5	2·19	146	—	2·8	4 0	3 1	15 6
Crushed Rock Phosphate (A.S.P.)	7	2·13	139	—	—	3 11	3 2	14 8
No-Manure (Check Plots)	8½	0·89	—	—	—	—	—	—

This table shows that when sheep are valued at 15s. each per annum, the profit obtained due to fertiliser has been approximately the same from the use of Superphosphate only, and from Lime and Superphosphate combined. The cost of Superphosphate dressings has been 5s. 5d. per acre, or 2s. 7d. per sheep, whilst that of Superphosphate and Lime combined has been 9s. 6d. per acre, or 3s. 11d. per sheep. The extra sheep carried on the Lime and Superphosphate plots has only covered costs.

Crushed Limestone and Superphosphate combined show a profit of 25s. 9d. per acre per annum, only 11d. less than Burnt Lime and Superphosphate, whilst Gypsum and Superphosphate combined and Ephos Phosphate have returned much lower profits, with 18s. 10d. and 15s. 6d. per acre respectively.

Rock Phosphate, with its low annual cost of 3s. 11d. per acre, has returned 14s. 8d. per acre profit.

With reference to the type and variety of plants growing on these series of plots, the monthly estimations taken throughout the growing period of 1934 have been averaged and are shown in the following table with those of 1933.

TABLE 5.—*Botanical Analyses of Natural Pasture Plots, Kybybolite,* 1933 *and* 1934.

Species.	Rock Phosphate Plots.		Superphos-phate Plots.		Lime and Superphos-phate Plots.		Average all Fertilised Plots.		Check Plots No-Manure.	
	1933. %	1934. %	1933. %	1934. %	1933. %	1934. %	1933. %	1934. %	1933. %	1934. %
Grasses	65·45	65·70	68·58	62·25	67·99	57·88	67·39	61·07	44·87	43·40
Clovers	16·23	16·00	19·75	22·12	10·07	24·12	16·81	21·65	0·18	0·70
Erodium	0·96	0·60	1·78	0·80	7·04	2·20	3·26	1·38	trace	trace
Thistles	0·08	—	0·68	0·30	2·32	0·50	1·03	0·32	0·35	0·10
Capeweed	0·12	—	0·65	0·33	1·49	0·65	0·81	0·40	0·12	—
Miscellaneous	12·39	6·30	6·64	5·59	7·95	7·55	7·82	7·61	29·76	27·50
Bare Space	4·76	11·40	1·91	8·61	3·12	7·10	2·88	8·56	24·72	28·30

Factors of note from this table are the percentage of grass to clover under the various fertilisings, the almost complete absence of clover growths on the check plots, and the great reduction of miscellaneous plants and bare space on the fertilised plots.

In 1934 the proportion of clover was greater and that of grass was less than the previous season, particularly on the Lime and Superphosphate dressed plots. The pasture on the Rock Phosphate dressed plots has scarcely varied. The percentage of clover on the Limed plots was 24 per cent. this year and only 10 per cent. in 1933, whilst on the plots dressed only with Superphosphate its percentage was 22 per cent. and 20 per cent. respectively.

The variation of grass percentage, except that it has been reversed, has been somewhat similar. On the Limed plots it was 68 per cent. in 1933 and 58 per cent. in 1934, whilst on the Superphosphate plots it was 68½ per cent. in 1933 and 62 per cent. in 1934.

Although the Limed plots still produced the most Erodium, Thistle, and Cape Weed; the proportion of these plants in 1934 was considerably less than in 1933. For the two seasons the amount of Erodium has been 4.6 per cent. on the Limed plots as against 1.29 per cent. on the Superphosphate plots, the amount of Thistle has been 1.4 per cent. and 0.49 per cent., and that of Cape Weed 1.07 per cent. and 0.49 per cent. respectively. The amount of bare space on all plots was greater in 1934, and was due to the unusually dry periods of May and June, which caused the plots to be grazed back very much harder at that period.

Time does not permit to analyse fully the various grasses that grow on the plots, but each autumn counts and measurements were made of the *Danthonia* (Native Wallaby Grass) plants by reading six indiscriminate square metres on each plot. On averaging the growths of the last three autumns, the number and size of plants per square metre on the various fertilisings were as follows:—

	Number of Plants.	Diameter in Inches at Ground Level
Check Plots (no manure)	112	0·75
Rock Phosphate plots....................................	58	1·58
Superphosphate plots......................................	39	1·47
Lime and Superphosphate plots	24	1·39

This result shows that the fertilising has apparently depressed the number of permanent native grass roots, but has increased the vigour of those that have survived.

In records of the development and production of sheep flocks, used for grazing these natural pasture plots, Table 6 shows the average live weight of Comeback ewes, the average weight of wool, percentage of lambs marked, average weight of lambs at weaning, and the sheep carried per acre for each of the four flocks during the past five seasons.

TABLE 6—*Weights of Sheep and Wool—Natural Pasture Plots*, 1930 35

Flock.	No of Ewes.	Kind of Fertiliser on Plots.	Average Weight of Ewes.			Average Weight of Wool per Sheep			Lambs Marked			Average Weight of Lambs at Weaning.			Sheep Carried per Acre.		
				Lbs			Lbs Ozs			%			Lbs				
A	9	No manure	8/4/30	83·8	92·6	17/10/30	6 10	8 5	9/10/30	22	64·6	8/1/31	40·0	58·2	1930–1	1·16	1·01
			31/3/31	93·2		21/10/31	8 7		1/10/31	66		5/1/32	60·8		1931–2	1·00	
			30/3/32	90·7		25/10/32	9 6		1/10/32	79		17/1/33	61·9		1932–3	1·11	
			31/3/33	98·6		12/10/33	8 1		1/10/33	89		4/1/34	65·3		1933–4	0·89	
			31/3/34	98·7		22/10/34	9 1		1/10/34	67		15/1/35	63·0		1934–5	0·90	
			31/3/35	90·4													
B	26	Superphosphate	8/4/30	90·0	94·0	17/10/30	6 14	8 6	9/10/30	81	79	8/1/31	44·5	52·6	1930–1	2·87	3·62
			31/3/31	82·5		21/10/31	8 0		1/10/31	50		5/1/32	57·3		1931–2	3·27	
			30/3/32	98·5		25/10/32	9 13		1/10/32	92		17/1/33	57·0		1932–3	3·44	
			31/3/33	100·6		12/10/33	8 8		1/10/33	80		4/1/34	59·1		1933–4	3·78	
			31/3/34	99·7		22/10/34	8 13		1/10/34	92		15/1/35	44·9		1934–5	4·76	
			31/3/35	92·8													
C	36	Lime, Gypsum, and Super phosphate	8/4/30	89·3	96·6	17/10/30	7 10	8 4	9/10/30	89	87·6	8/1/31	39·2	50·6	1930–1	3·45	3·68
			31/3/31	87·3		21/10/31	8 3		1/10/31	66		5/1/32	52·6		1931–2	3·32	
			30/3/32	95·3		25/10/32	9 7		1/10/32	86		17/1/33	58·4		1932–3	3·56	
			31/3/33	106·1		12/10/33	7 5		1/10/33	94		4/1/34	56·9		1933–4	3·61	
			31/3/34	103·5		22/10/34	8 9		1/10/34	103		15/1/35	45·8		1934–5	4·45	
			31/3/35	97·9													
D	15	Rock Phosphate	8/4/30	91·2	87·9	17/10/30	8 11	8 8	9/10/30	80	80·4	8/1/31	44·2	49·3	1930–1	1·96	2·14
			31/3/31	84·7		21/10/31	7 15		1/10/31	73		5/1/32	48·5		1931–2	2·11	
			30/3/32	84·3		25/10/32	9 7		1/10/32	93		17/1/33	53·5		1932–3	2·13	
			31/3/33	89·6		12/10/33	7 9		1/10/33	71		4/1/34	59·9		1933–4	2·28	
			31/3/34	97·4		22/10/34	9 0		1/10/34	85		15/1/35	40·6		1934–5	2·21	
			31/3/35	80·0													

All of the ewes in these four flocks are of similar age and breeding (1928 spring drop), and were selected as even in type and development in May, 1929. Since then they have been kept wholly on the one class of pasture. Except for a few weeks in the autumn of each season, when the 86 ewes were mated together as one flock with Merino rams, they have been pastured on the respective plots, fertilised as shown in Table 6. They have received no hand feeding, nor provided with any licks.

The average live weights of ewes quoted are those taken about the close of March each season, a time when their weights were lowest. During each season of growing pasture, the ewes increased in weight and during each late summer and autumn they decreased in weight.

The average maximum weights attained by the four flocks for the five seasons, which occurred in the late spring, were:—

	Lbs.
Flock A	109.9
Flock B	115.7
Flock C	120.6
Flock D	105.9

Unimproved Pasture at Kybybolite. Carrying capacity, 0.69 sheep per acre per annum.

When these are compared with the autumn weights given in Table 6, it is seen that the average difference between the maximum and minimum weights of each flock has been: —

	Lbs.	Variation Per cent.
Flock A	17.3	18.7
Flock B	21.7	23.1
Flock C	24.0	24.8
Flock D	18.0	20.5

Hence the ewes pasturing on the natural pasture, that has been fertilised with Superphosphate only, and with Lime and Superphosphate combined, have shown that they reached much higher weights during the flush parts of the seasons, but also lost more pounds in weight during the dry-grazing periods.

At all times, however, they maintained greater weights than those on unfertilised pasture, despite the fact that there were less dry ewes in these flocks than in A flock. Those on pasture fertilised with both Lime and Superphosphate have maintained slightly better weights than those on pasture fertilised only with Superphosphate, especially during the last three seasons.

As regards the wool production per head, the figures in Table 6 show that there has been no material difference between the flocks. There has been a difference of only 4ozs. per head between the highest and lowest average—8lbs. 4ozs. from Flock C; 8lbs. 5ozs. from Flock A; 8lbs. 6ozs. from Flock B; and 8lbs. 8ozs. from Flock D.

The lambing percentages, however, show a distinct difference, those on the Lime and Superphosphate pasture yielding an average of 87.6 per cent. over the five seasons, as against only 64.6 per cent. from the flock on unmanured pasture, the former producing the highest percentage of the four flocks in three seasons, 1930, 1933, and 1934, whilst D Flock on Rock Phosphate fertilised pasture gave the highest percentage in the other two seasons, 1931 and 1932. Both B and D Flocks with 79 per cent. and 80 per cent. averages, were considerably better breeders than A Flock. These figures are the actual percentages of lambs marked. For three of the five seasons a record of the births, and the deaths that occurred between birth and marking has been kept, and although these deaths have been 100 per cent. greater in A Flock than in the others there is still a high margin between the flocks. This experiment, therefore, shows that ewes grazed on natural pasture fertilised with Lime and Phosphate are more fertile by 7 per cent to 10 per cent. than those grazed on the same pasture manured only with Phosphates, and by 18 per cent. than those grazed on the same pasture not manured at all. The high percentages of 94 and 103 secured from the former flock for the last two seasons indicate that their health, vigour, and fertility have been very well maintained into the sixth year of life of the ewes.

The weights of lambs at weaning show that those from the A Flock have been the heavier lambs. This is due entirely to the different summer feed available during December on the unfertilised pasture. These fertilised pastures at this time of the year contain a large proportion of dry annual grasses, such as Barley and Silver Grasses, with their objectionable seed heads, which have proved detrimental to the lambs. It is definitely not due to the strength of the lambs, as the lambs in B and C Flocks have invariably been stronger from birth, and for the five seasons averaged 2lbs. greater in weight during October months than those on the unmanured pasture.

It must be noted that to supplement the amount of unfertilised feed, Plot No. 9 in unmanured clover land series necessarily had to be used by Flock A, which accounts for the carrying capacity of plots grazed showing at 1.01 sheep per annum, which is higher than unfertilised virgin land, and should, if anything, give the flock an advantage.

Regarding losses of sheep that have occurred amongst these flocks, eight ewes of the original 87 have died, two in Flock A, three in Flock B, two in Flock D, and one in Flock C. One died as a hogget in Flock B in 1929, one died at four years of age in the same flock in 1932, two died at five years of age in Flock D in 1933, and four died at six years of age in 1934, including two in Flock A and one in each of Flocks B and C. The annual percentage loss of ewes over the six seasons for each flock has therefore been as follows:—

		Per Cent.
Flock A (9 ewes)	2 deaths	3.70
Flock B (27 ewes)	3 deaths	1.85
Flock C (36 ewes)	1 death	0.46
Flock D (15 ewes)	2 deaths	2.22
All flocks (87 ewes)	8 deaths	1.53 per annum

This loss of 1½ per cent. per annum is small and as most of the deaths have occurred at five and six years of age the loss can only be looked upon as a normal one in flocks.

Referring to the losses of lambs that have occurred between marking and weaning for the five lambing seasons, these have been as follows:—

Flock A has lost 3 lambs from 29 marked, *i.e.*, 10.34 per cent.
Flock B has lost 5 lambs from 102 marked, *i.e.*, 4.90 per cent.
Flock C has lost 8 lambs from 157 marked, *i.e.*, 5.10 per cent.
Flock D has lost 0 lambs from 58 marked, *i.e.*, nil

Total .. .. 16 lambs from 346 marked, *i.e.*, 4.62 per cent.

Subterranean Clover and Wimmera Rye Grass Pasture Plots at Kybybolite.

During the immediate past three seasons, a record has been kept of the losses of lambs at birth and between birth and marking. The numbers for each flock for the three seasons have been:—

Flock A	4 lambs, *i.e.*,	16.0 per cent.
Flock B	4 lambs, *i.e.*,	5.80 per cent.
Flock C	9 lambs, *i.e.*,	8.18 per cent.
Flock D	3 lambs, *i.e.*,	7.89 per cent.
Total	20 lambs, *i.e.*,	8.26 per cent.

These lamb losses have been comparatively small, but it is worthy of note that on the manured plots they have been only half proportionately to those on unmanured pasture, where 26 per cent. of births have died by weaning time. This must undoubtedly be regarded as a definite illustration of the better health of stock obtained by manuring the feed with Phosphates and Lime.

Summarily, the results of top dressing this natural pasture show a large increase in wool production per acre. The averages for the past five seasons show that the unmanured land has returned 8.39lbs. of wool per acre per annum; the same virgin land fertilised with Superphosphate only has returned 30.32lbs. of wool (261 per cent. increase); fertilised with Lime and Superphosphate it has returned 30.36lbs. (262 per cent. increase); and fertilised with Rock Phosphates it has returned 18.19lbs. of wool (117 per cent. increase) per acre per annum.

The ewes used in this experiment are now 6½ years of age, and five seasons' results of their production have been reported, and it is now proposed to discontinue further recording of the behaviour of sheep on the various fertilisings of natural pasture.

SOWN PASTURES—SUBTERRANEAN CLOVER AND WIMMERA RYE GRASS.

Thirteen of the 15 plots of this pasture mixture established during 1924 were maintained, and fully grazed during the season. They were again grazed in rotation using 252 Comeback ewes, including 62 (1929 drop), 49 (1930 drop), 46 (1931 drop), 32 (1932 drop), and 63 (1933 drop). The 52 aged half-breds previously used in these flocks were culled this season, and were replaced by 63 Comeback hoggets, so that the flocks now consist entirely of ewes bred and reared on these plots, and have received no supplementay feed or licks. They were proportionately divided into four flocks, and grazing has been continuous on the plots for the whole season.

Table 7 shows the fertiliser given to various plots with the rate and time of application, and Table 8 shows the grazing results for the past 10 years:—

TABLE 7.—*Fertilising of Subterranean Clover and Wimmera Rye Grass Pasture Test, Kybybolite,* 1923-35.

Plot.	Fertiliser per Acre.	Date of Application.	
9	No manure (check plot)	—	—
10	448lbs. 82 per cent. Island Phosphate	One application, 1924	—
	448lbs. 82 per cent. Island Phosphate	One application, 1929	55lbs. A.S. Phosphate,
	586lbs. 82 per cent. Island Phosphate	One application, 1934	equal 37lbs. annually
11	448lbs. 82 per cent. Island Phosphate	One application, 1924	77½lbs A.S. Phosphate,
	293lbs. 82 per cent. Island Phosphate	One application, 1934	equal 18½lbs. annually
14	6cwts. 33 per cent. Bone Manure ...	One application, 1924	139lbs. A.S. Phosphate,
	98lbs. 82 per cent. Island Phosphate.	One application, 1934	equal 9¼lbs. annually
13	37lbs. 90 per cent. Potash	Annually, 1924-34 ..	—
	448lbs. 82 per cent. Island Phosphate	One application, 1924	—
	448lbs. 82 per cent. Island Phosphate	One application, 1929	555lbs. A.S. Phosphate,
	586lbs. 82 per cent. Island Phosphate	One application, 1934	equal 37lbs. annually
12	37lbs. 90 per cent. Potash	Annually, 1924-34 ..	—
6	45lbs. 45 per cent. Superphosphate .	Annually, 1927-34 ..	9¼lbs. W.S. Phosphate, annually
4	90lbs. 45 per cent. Superphosphate .	Annually, 1923-34 ..	18½lbs. W.S. Phosphate, annually
5	180lbs. 45 per cent. Superphosphate	Annually, 1928-34 ..	37lbs. W.S. Phosphate, annually
15	112lbs. 45 per cent. superphophate ..	Annually, 1924-34 ..	23lbs. W.S. Phosphate, annually
3	10cwts. Lime	One application, 1923	—
	1cwt. Tetraphosphate..............	Annually, 1923-27 ..	—
	1 ton Gypsum	One application, 1928	—
	112lbs. 45 per cent. Superphosphate	Annually, 1928-34 ..	23lbs., W.S. Phosphate, annually
7	1 ton Lime	One application, 1924	—
1	1 ton Lime	One application, 1934	—
	112lbs. 45 per cent. Superphosphate	Annually, 1924-34 ..	23lbs. W.S. Phosphate, annually
8	672lbs. 61 per cent. Ephos Phosphate	One application, 1924	278lbs. A. & C. S. Phos.,
	635lbs. 31 per cent. Basic Slag	One application, 1934	equals 18½lbs., annually

TABLE 8.—*Returns of Subterranean Clover and Wimmera Rye Grass Grazing Test, Kybybolite,* 1925-35.

Year.	Grazing in Sheep per Acre.													
	Check Plot	Rock Phosphate Plots.			Potash Plots.		Superphosphate Plots.				Lime, Gypsum, and Super. Plots.			Means.
	No. 9.	No. 10.	No. 11.	No. 14.	No. 13.	No. 12.	No. 6.	No. 4.	No. 15.	No. 5.	No. 3.	No. 7.	No. 8.	
1925-26	2·13	3·02	3·62	3·13	3·27	2·60	1·81	3·12	3·51	3·06	2·47	3·04	3·32	2·92
1926-27	1·95	3·79	3·68	2·68	3·69	2·68	1·88	3·72	4·14	3·21	2·97	3·70	3·95	3·26
1927-28	1·94	3·01	3·76	3·07	3·40	1·99	2·70	3·05	3·71	2·06	2·63	3·28	3·92	2·88
1928-29	1·20	2·49	3·88	2·98	3·62	2·25	2·73	3·90	4·05	4·35	4·27	3·96	3·75	3·25
1929-30	1·16	2·75	2·70	2·67	3·34	2·13	2·55	4·52	4·32	5·37	4·40	4·52	3·77	3·32
1930-31	1·27	2·76	3·82	2·26	3·04	2·47	3·53	4·30	2·91	5·29	4·79	5·24	5·09	3·42
1931-32	0·88	3·37	2·56	2·62	3·90	2·03	2·58	4·86	4·53	4·77	5·18	5·47	4·14	3·54
1932-33	1·22	3·26	4·09	2·75	4·05	2·40	3·14	4·52	4·84	5·13	4·63	5·68	4·05	3·74
1933-34	0·94	3·86	3·64	3·03	4·72	2·17	4·30	6·48	4·71	6·11	5·09	5 84	3·85	4·11
1934-35	0·83	3·64	3·67	2·35	4·34	1·56	4·04	5·22	5·32	6·23	5·44	5·97	4 38	4·02
Means—														
1925-35	1·35	3·19	3·54	2·75	3·74	2·23	2·93	4·37	4·20	4·56	4·19	4·67	4·02	3·45
1928-35	1·07	3·16	3·48	2·67	3·86	2·14	3·27	4·83	4·38	5·32	4·83	5·24	4·15	3·63
			3·10					4·45				4·74		
Increase over no manure		2·09	2·41	1·60	2·79	1·07	2·20	3·76	3·31	4·25	3·76	4·17	3·08	
			2·03					3·38				3·67		
Increase over rock phosphate					·76		0·17	1·73	1·28	2·22	1·73	2·14	1·05	
								1·35				1·64		
Increase over superphosphate											0·38	0·79	—	
												0·29		
Increase over potash		1·02	1·34	0·53	1·72		1·13	2·69	2·24	3·18	2·60	3·10	2·01	
			0·96					2·31				2·60		

These results show that Subterranean Clover pasture, that has been receiving continued applications of fertiliser, is increasing its carrying capacity annually. This season the average number of sheep carried over all plots has been 4.02 per acre, just a little less than the previous season, but considerably more than was carried during the first few seasons of development. The average carried on all plots for the 10 years has been 3.45 sheep, whilst for the last seven seasons it has been 3.63 sheep, and for the last three years 3.95 sheep per acre have been carried. These results are quite 1 sheep per acre better than the average secured from improved natural pasture previously discussed.

Considering the individual plots, No. 5 dressed with 180lbs. 45 per cent. superphosphate annually has been the most productive, again exceeding 6 sheep per acre (6.23 this season and 6.11 last season). This plot has maintained a very healthy and vigorous pasture throughout the whole of the growing period, and the increasing capabilities of the plot are significant in showing that the limit of production from the use of superphosphate and Subterranean clover in these soils is not yet attained. Plot No. 7, fertilised with lime and superphosphate, in carrying 5.97 sheep per acre for the season, again maintained a very vigorous pasture, and continues to show a steady rise in stock carrying. With this plot there has been a steady annual rise since 1927 from 3¼ sheep to 6 sheep per acre. Three other plots exceeded 5 sheep per acre, namely No. 3, fertilised with gypsum and superphosphate, carried 5.44 sheep; No. 15, dressed with 1cwt. superphosphate annually carried 5.32 sheep; and No. 4, dressed with 90lbs. superphosphate annually carried 5.22 sheep. It is significant that the plots receiving the least phosphate fertiliser carried the lowest number of stock, and the two plots (Nos. 9 and 12) that have received no phosphate fertiliser at all carried less stock this season than they have during any season of the last ten. This clearly shows the ability of well-fertilised pasture to withstand dry winter periods such as we experienced last May and June.

For the 10 years Plot No. 7 (lime and superphosphate) has been the most productive with 4.67 sheep per acre per annum, and No. 5 (heaviest dressed superphosphate plot) is second in productivity with 4.56 sheep, closely followed by No. 4 (90lbs. superphosphate) with 4.37 sheep. Plots No. 15 (1cwt. superphosphate), No. 3 (gypsum and superphosphate), and No. 8 (basic slag) have also exceeded 4 sheep per acre per annum.

For the immediate past seven years, however, Plot No. 5 (180lbs. superphosphate) has yielded greatest return with 5.32 sheep per acre per annum, closely followed by No. 7 (lime and superphosphate) with 5.24 sheep. For the same period, No. 4 (90lbs. superphosphate) and No. 3 (gypsum and superphosphate) have carried 4.83 sheep; No. 15 (1cwt. superphosphate), 4.38; and No. 8 (basic slag), 4.15 sheep per annum.

As a comparison of the quantity of superphosphate test Table 9 shows the results from 180lbs., 90lbs., and 45lbs. dressings compared with no manure:—

TABLE 9.—*Superphosphate Quantity Test on Subterranean Clover and Wimmera Rye Grass, Kybybolite,* 1928-35.

Plot.	Sheep Carried per Acre.	Increase over no Manure.	Annual Cost of Fertiliser per Acre.	Annual Cost of Fertiliser per Sheep.	Value of increased Grazing at 15s. per Sheep.	Profit per Acre per Annum due to Fertiliser.
	%	%	*s. d.*	*s. d.*	*s. d*	*s. d.*
Super—						
No. 5 180lbs. (37lbs. phos. acid) ...	5 32	4·25	8 7	2 0	63 9	55 2
No. 4 90lbs. (18½lbs. phos. acid) ...	4·83	3 76	4 6	1 2	56 5	51 11
No. 6 45lbs. (9¼lbs. phos. acid)	3·27	2·20	2 6	1 2	33 0	30 6
No. 9 No manure	1·07	—	—	—	—	—

These results are the average annual returns over seven consecutive seasons, and indicate the values to be obtained from the use of Superphosphate on a sown pasture of Subterranean Clover and Wimmera Rye Grass, combined with systematic rotational grazing. For this grazing the fertilised plots have been fed off monthly in rotation with approximately 16 sheep per acre, whilst the unfertilised plot was grazed monthly with approximately three sheep per acre. The table shows that when sheep are valued at 15s. each per annum the increased return per acre per annum due to the fertiliser has been 55s. 2d. from the 180lbs. dressing, 51s. 11d. from the 90lbs. dressing, and only 30s. 6d. from the 45lbs. application. Hence it appears that the 90lbs. annual application is very suitable and economical under local conditions.

Referring further to Table 8 the averages for 10 seasons show that lime and superphosphate are the most productive of the fertilisers tried. The two combined have given the greatest yield, whilst superphosphate on its own has yielded almost as well in quantity of feed. Lime has an advantage, however, in producing quicker early feed, and more during the colder months of the year.

Table 10 shows the comparison of Lime, Gypsum and Basic Slag with that of Superphosphate only.

TABLE 10.—*Lime, Gypsum, and Basic Slag Test on Subterranean Clover and Wimmera Rye Grass, Kybybolite,* 1928-35.

Plot.	Fertiliser.	Sheep carried per Acre.	Increase over no Manure.	Cost of Fertiliser per Acre.	Cost of Fertiliser per Sheep.	Value of increased grazing at 15s. per Sheep.	Profit per acre per annum due to Fertiliser.
				s. d.	*s. d.*	*s. d.*	*s. d.*
7	Lime & Super. .	5·24	4·17	10 6	2 6	62 7	52 1
3	Gypsum & Super.	4·83	3·76	10 6	2 10	56 5	45 11
8	BasicSlag	4·15	3·08	8 8	2 11	46 2	37 6
4	Superphosphate	4·83	3·76	4 6	1 2	56 5	51 11
9	No Manure	1·07	—	—	—	—	—

These results show that although Lime and Superphosphate together provide more feed, the increase apparently due to lime, just covers cost of lime, there being practically no greater profit than that received from Superphosphate used on its own. The only possible advantages at present shown from the use of Lime are the quicker early autumn and winter growths, and a slightly higher proportion of grass to clover in the pasture.

The result from Gypsum, so far, shows no greater return in quantity of feed than from Superphosphate only. Also that received from Basic Slag or Ephos Phosphate (citrate soluble phosphatic fertilisers) has not been as great as the quantity of grazing provided by Superphosphate, and shows only a profit of 37s. 6d. per acre, compared with 51s. 11d. from Superphosphate, and 52s. 1d. from Lime and Superphosphate.

TABLE 11.—*Acid Soluble Phosphate Fertiliser Test on Subterranean Clover and Wimmera Rye Grass, Kybybolite,* 1928-35.

Plot.	Fertiliser. (Island Phosphate.)	Sheep. carried per Acre.	Increase over no Manure.	Fertiliser Applied every Five Years.			
				Cost of Fertiliser per Acre.	Cost of Fertiliser per Sheep.	Value of increased grazing at 15s. per Sheep.	Profit per Acre per annum due to Fertiliser.
				s. d.	*s. d.*	*s. d.*	*s. d.*
10	494lbs. (37lbs. Ph. Ac. p. a.).	3 16	2·09	4 2	2 0	31 4	27 2
11	247lbs. (18½lbs. Ph. Ac. p. a.)	3·48	2·41	2 1	0 10	36 2	34 1
14	123lbs. (9¼lbs. Ph. Ac. p. a.)	2 67	1·60	1 1	0 8	24 0	22 11
9	No Manure	1 07	—	—	—	—	—

Table 11 compares the results secured from applications of acid soluble phosphatic fertiliser, applied every five years, at rates equivalent in phosphoric acid content to annual applications of 180lbs., 90lbs., and 45lbs. of 45 per cent. Superphosphate. These results so far show advantage to the medium application of 247lbs. 82 per cent. Island Phosphate per acre every five years, but the returns show only 61 per cent. of the profit secured from similar quantities of water soluble phosphate, as given in Table 9.

TABLE 12.—*Potash Fertiliser Test on Subterranean Clover and Wimmera Rye Grass, Kybybolite,* 1928-35.

Plot.	Fertiliser.	Sheep carried per Acre.	Increase over no Manure.	Cost of Fertiliser per Acre.	Cost of Fertiliser per Sheep.	Value of increased grazing at 15s. per Sheep.	Profit per per annum due to Fertiliser.
				s. d.	*s. d.*	*s. d.*	*s. d.*
13	Island Phosphate and Potash ..	3·86	2·79	9 8	3 6	41 10	32 2
10	Island Phosphate	3·16	2·09	4 2	2 0	31 4	27 2
12	Potash	2·14	1·07	5 6	5 2	16 1	10 7
9	No Manure	1·07	—	—	—	—	—

This table compares the results secured from potash fertiliser on its own, and in conjunction with acid soluble phosphatic fertiliser, and indicates a profit of 10s. 7d. over no manure, and 5s. over acid soluble phosphate. These differences are small, and show no great need for this type of fertiliser at the present stage of development.

Natural virgin unimproved pasture at Kybybolite. Carrying capacity, 0.69 sheep per acre per annum.

The values in these four tables have been calculated from the following manure prices, plus cost of application, and the sheep value used has been 15s. per annum.

	Per Ton. £	s.	d.
Superphosphate	5	0	0
Island Phosphate	4	10	0
Basic Slag	7	0	0
Lime	2	0	0
Gypsum	2	0	0
Potash	15	0	0

With reference to the variety of growths now appearing on these plots, monthly estimations have been taken throughout the growing periods of the last two seasons by reading six indiscriminate quadrat sections on each plot. Table 13 shows the average per centage of annual grasses, Subterranean Clover, Cape Weed, Thistles, &c., on the various series of fertilised plots taken during the seven months of growing pasture of both seasons.

TABLE 13.—*Botanical Analyses of Clover Pasture Plots, Kybybolite,* 1933 *and* 1934.

Species.	Rock Phosphate Plots.		Super-phosphate Plots.		Gypsum and Super. Plot.		Lime and Super. Plot.		Basic Slag Plot.		Potash Plot.		Average all Phosphate Plots.		Check no Manure Plot.	
	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Grasses	31·5	33·70	43·11	48·95	50·94	54·60	60·69	52·41	34·62	39·11	30·59	28·61	40·81	44·68	14·77	9·86
Clover (Subt.)	65·69	60·27	53·53	44·92	46·41	39·48	26·43	39·61	55·94	53·13	61·18	60·74	54·48	48·98	79·40	71·03
Thistles	0·20	0·03	0·23	0·48	1·09	1·25	8·21	2·89	0·47	0·22	trace	trace	1·14	0·63	trace	trace
Cape Weed	0·16	trace	0·80	0·14	0·24	trace	1·67	trace	7·27	2·39	trace	trace	1·17	0·27	trace	0·07
Miscellaneous	0·99	0·27	1·64	0·83	0·96	0·87	2·73	2·35	0·60	1·45	4·56	1·97	1·49	0·81	1·41	1·54
Bare Space	1·46	5·73	0·68	4·68	0·36	3·80	0·27	2·74	1·10	3·70	3·67	8·67	0·90	4·63	4·41	17·50

In making the estimation of pasture plants no attempt has been made to separate the various species of grasses. The grasses consisted wholly of annual types, principally Barley Grass, with some Wimmera Rye, Silver, and Sterile Brome. Wimmera Rye was not much in evidence, providing not more than 5 per cent. of the pasture on the best plots. An interesting factor shown by the above table is the variation in amount of grass to clover with the different manurings. The percentage of grass is highest on the Lime and Superphosphate plot with 56.55 per cent. average for the two seasons, and next highest on Gypsum and Superphosphate plot, 52.77 per cent. The same pasture fertilised with Superphosphate only has yielded 46.03 per cent. of grass. When fertilised with acid soluble phosphate the percentage of grass shows at 32.6 per cent., fertilised with potash only 29.6 per cent., fertilised with Basic Slag 36.86 per cent., whilst on unmanured pasture the percentage of grass has only been 12.32.

The percentage of clover has been reversed, being only 33.02 per cent. of the pasture on the Lime and Superphosphate plot, and 75.2 per cent. of the pasture on the unfertilised plot. It is necessary to state that these plots were established on old cultivated land, which contained a certain residue of phosphate from crop fertilisings, and which has enabled the Subterranean Clover to persist on the check plot throughout the 11-year period. However, although it has made cover over the plot to the extent of 75 per cent., the clover has made very little growth, and provided very poor feed.

Thistles have appeared on most fertilised plots in comparatively small numbers, except on the Lime and Superphosphate plot, which has contained on the average over 5 per cent. thistles, principally of the Scotch and Slender varieties.

Cape Weed was less consistent on the plots, and considerably less was present in 1934 than in 1933. The plot dressed with Basic Slag contained 4.83 per cent. for the two seasons, but none of the others carried any appreciable quantity.

Miscellaneous plants were also comparatively less in 1934, and were most plentiful on the Lime and Superphosphate, and potash dressed plots. Naturally the proportion of bare space was greater in 1934, due to the dry, early winter and consequent heavy winter grazing, but nevertheless the unmanured plot had very much the greatest proportion with 17.5 per cent. For the two seasons, the proportion on this plot has been 11 per cent. bare space, whilst on the potash dressed plot it has been 6.17 per cent., and the average of all phosphate dressed plots has been 2.76 per cent. The least bare ground has been on the limed plot with only 1.5 per cent.

TABLE 14.—*Botanical Analysis of Clover Pasture Fertilised with Various Quantities of Superphosphate, Kybybolite,* 1933 *and* 1934.

Species.	Plot 5 (180lbs.)		Plot 4 (90lbs.)		Plot 6 (45lbs.)	
	1933.	1934.	1933.	1934.	1933.	1934.
	%	%	%	%	%	%
Grasses	47·2	52·5	44 9	46·9	37·1	42·2
Clover	50 2	41·5	52·9	48·1	62·2	52·2
Thistles	0·1	1·4	0·1	0·2	0·1	Trace
Cape Weed	Trace	Trace	0·2	Trace	—	Trace
Miscellaneous	2·5	0·3	0·9	0·1	0·2	0·1
Bare Space	—	4·3	1·0	4·7	0·4	5·5

Table 14 shows the percentage estimated botanical composition of the pastures growing on the three plots dressed with varying amounts of 45 per cent. Superphosphate, and are most interesting in that they clearly show that the proportion of grass to clover is highest on the plot receiving the most Superphosphate. For both seasons a similar difference has been present, and the average for the annual dressing of 180lbs. shows approximately 50 per cent. grass and 46 per cent. clover, that for the 90lbs. dressing shows 46 per cent. grass and 50 per cent. clover, whilst that for the small dressing of 45lbs. shows grass only 40 per cent. and clover 57 per cent.

(*To be continued.*)

AGRICULTURE IN THE TEMPERATE AND SUB-TROPICAL CLIMATES OF THE SOUTH.

[A Report by the Deputy Director of Agriculture (W. J. Spafford) to His Excellency Sir Winston Dugan, K.C.M.G., C.B., D.S.O., Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia. Mr. Spafford took a brief tour of portions of the principal agricultural countries in the same climatic zones as the settled portions of Australia, in fulfilment of the appointment as Honorary Commissioner, conferred upon him by His Excellency, to inquire into and report upon the Production and Preparation for Marketing of Agricultural Products, including Crops and Livestock in South America, South Africa, and New Zealand.]*

(*Continued from page* 661.)

CHILE.

A peculiar-shaped country located along the western side of South America, between the Andes and the Pacific Ocean, Chile includes considerable areas of country which are rainless or almost so. Furthermore, much of the country is of volcanic origin, and although a serious disturbance has not occurred since the bad earthquake of 1906, small shocks are frequent, and the danger of big upheavals is ever-present. Despite these handicaps the Republic is a fairly important agricultural country, and will become increasingly so as time goes on, and, as the climatic conditions are quite similar to those of southern Australia, when Chile makes agricultural progress she must do it along similar lines to those followed by Australia.

THE COUNTRY OF CHILE.

In shape Chile is a very long, narrow strip of country bounded by the Pacific Ocean on the west and the mighty Andes on the east, and in all probability is the narrowest country in the world in proportion to its length. Although Chile has a coastline of 2,800 miles, the extreme length of the country, in a straight line, is 2,661 miles, with the width of the mainland varying from 46 to 228 miles, and of an average width of about 100 miles. The northern boundary of Chile is the southern boundary of Peru, and the northern extremity is at 17° 21′ south latitude, from where the country extends almost due south to Cape Horn, located at 55° 58′ 40″ south latitude. The countries on the eastern boundary are Bolivia for a short distance in the north and Argentina for the remainder of the way. From the north, down to somewhere near the forty-second parallel, the coastline is comparatively regular, but below this point is very broken and a great number of islands are located close to the shore-line. The total area of the country is variously computed, but the official figure, which includes all islands, is 307,774 square miles, or 196,975,360 acres.

As is to be expected in a country with one of its boundaries the ridge of such a high range of mountains as is the Andes, and that boundary only averaging about 100 miles from the coastline, Chile is a mountainous country, and only a relatively small proportion of its area is suitable for arable agriculture. It is not only the mountainous nature of the country which renders so much of it unsuitable for cultivation, but a very large proportion of the northern end is

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***Tour made in the company of Col. C. P. Butler ("Yattalunga," of the *Advertiser*).**

rainless, or almost so. From an agricultural point of view the country is generally divided into the deserts of the north, the arable lands of the central regions, and the forest areas of the south. It is in the northern desert area where the huge deposits of nitrate of soda are located, and besides containing this substance the zone is rich in metals of several kinds. A little agriculture under irrigation is practised in the north of Chile, but most of the streams originating in the Andes are very short, the water sinking into the bare sun-baked lands of the desert. Most of the crop-growing and stock-raising activities of Chile are carried out in the central zone, and in the south nearly all of the lands are still under forest, except near the extreme end of the country, where large numbers of sheep are maintained.

[From *Bulletin of the Pan American Union.*

A Livestock Farm, well up in the Mountains, near the Town of Los Andes. Although so much of Chile is high above sea level, there are rich tablelands and very fertile valleys in the hills. The illustration shows a luxuriant pasture on a plain, backed by the snow-capped Andes, and protected by Poplar trees, which are commonly grown as breakwinds in the country.

The utilisation of the agricultural lands of the three main regions of Chile is set out below:—

*Utilisation of the Agricultural Lands of Chile.**

Utilisation.	North Chile.	Central Chile.	South Chile.	Whole Country.
	Acres.	Acres.	Acres.	Acres.
Being farmed	52,611	8,265,114	22,971	8,340,696
Vines and fruits	5,681	288,249	247	294,177
Woods, thickets, and natural pastures	703,950	30,162,652	20,758,621	51,625,223
Unproductive	1,108,042	5,657,782	437,190	7,203,014
Total Agricultural	1,870,284	44,373,797	21,219,029	67,463,110
Total area of Chile	—	—	—	183,274,000

* Sinopsis Geográfico-Estadística de la República de Chile.

THE RAINFALL OF CHILE.

One end of this long narrow country of Chile is almost rainless whilst towards the southern end more than 80ins. of rain are received annually on the average. The desert area does not extend right across the northern end of the country, but runs along the coast from the boundary of Peru to a little below Antofagasta, then leaves the coast and continues down the middle of the country for some 150 miles or so. This dry zone is about half of the width of the country throughout the length of the zone. Between the desert area and the ridge of the Andes the average annual rainfall gradually gets greater, and in going south heavier and heavier rainfalls are recorded, until the southern extremity of the country is approached where considerably reduced amounts are received. The approximate areas of country receiving different amounts of rain are somewhat as follows:—

Below 0.4ins.	about 39,000 square miles.
Between 0.4 and 4ins. ..	about 66,000 "
" 4 and 10ins. ..	about 19,000 "
" 10 and 20ins. ..	about 10,000 "
" 20 and 40ins. ..	about 39,000 "
" 40 and 80ins. ..	about 39,000 "
Above 80ins.	about 96,000 "

Except in the zones receiving the very heaviest average annual rainfalls most of the rain is received in the winter, and the summer is dry, and in many places there are usually but four or five wet months in the year, and very little precipitation during the remainder of the year.

The next table sets out the average annual rainfall and the average annual maximum and minimum temperatures for 19 recording stations fairly evenly spaced down the length of Chile:—

Temperatures and Rainfalls of Chile.

Recording Station.	Province or Territory.	Period of Records.	Latitude: South.	Longitude: West.	Height above Sea.	Average Annual Temperature.		Av. An Rainfall.
						Max.	Min.	
		Years.			Ft.	Deg. F.	Deg. F	In.
Arica	Tacna	15	18° 28′	70° 20′	16	71·2	58·8	*—
Iquique	Tarapacá	22	20° 12′	70° 11′	20	70·7	56·6	*—
Antofagasta	Antofagasta ..	17	23° 30′	70° 25′	210	71·6	57·0	0·2
Refresco . ..	Antofagasta ...	19	25° 19′	69° 52′	6,068	79·0	13·9	0·2
Potrerillos . ..	Atacama	11	26° 30′	69° 27′	9,348	62·4	56·1	3·0
Copiapó	Atacama ..	11	27° 21′	70° 21′	1,246	56·1	76·5	0·9
Tortuga	Coquimbo	22	29° 55′	71° 22′	82	63·5	53·1	4·9
Zapallar	Aconcagua	15	32° 32′	71° 30′	98	64·4	51·8	14·3
Valparaiso	Valparaiso	22	33° 01′	71° 38′	134	66·0	51·3	20·9
Santiago	Santiago	67	33° 27′	70° 42′	1,706	72·1	45·5	14·2
El Teniente	O'Higgins	21	34° 06′	70° 22	5,600	57·4	40·5	41·3
Carranza	Maule	22	35° 36′	72° 38′	98	60·6	48·2	28·5
Contulmo..... ..	Malleco .. .	22	38° 02′	73° 13′	98	66·9	44·8	74·0
Punta Galera	Valdivia	22	40° 01′	73° 44′	131	56·7	47·5	83·9
Punta Corona	Llanquihue	20	40° 47′	73° 52′	157	56·4	46·0	82·3
Isla Guafo	Chiloe	22	43° 34′	74° 45′	459	53·1	45·3	42·5
Cabo Raper	Llanquihue	5	46° 59′	73° 35′	131	52·0	43·2	70·9
Punta Dungeness .	Magallanes	22	52° 24′	68° 26′	16	50·4	38·8	8·1
Magallanes	Magallanes . .	22	53° 10′	70° 54′	92	49·8	38·1	16·1

* Below 0·1in.

CHILE, AN AGRICULTURAL COUNTRY.

In the past a lot of the wealth of Chile was derived from the wonderful deposits of nitrate of soda and from the metals from her mines, but of recent years so many countries have been collecting and storing nitrogen from the air that much of the value of these enormous nitrate deposits has gone, and she is now developing her agricultural resources as never before. The extreme length and narrowness of the country almost certainly increases the difficulties of political administration but it does not hamper agricultural operations or prospects in any way, and Chile is blessed with fairly considerable agricultural potentialities. Of the population of about 4,500,000 people something between 40 per cent. and 50 per cent. live in country districts and are directly dependent upon agriculture, but most rural practices are conducted in such a very primitive manner that the yields from crops and pastures are much lower than will be the case when improved methods are adopted. Much of the cultivation of crops grown in rows is still carried out by hand hoes; ploughing and cultivation is in many cases done with a bent stick shod with iron, or with a one-handled plough of primitive type; a pair of bullocks with yokes secured to the horns with green-hide thongs comprise the principal teams seen in Chile; cereals are cut with sickle, tramped out under the feet of horses and mules and winnowed in the wind; and other primitive methods are in vogue. On the other hand some of the larger agricultural holdings are conducted with the most modern methods, such as nurseries, vineyards, orchards, dairies, etc., and in some localities mixtures of primitive and modern systems are to be seen, and particularly in the cooler districts of the south, where sickles are still in use for the cutting of the crops, but power threshers, driven by the most modern of tractors or other engines, are used to thresh and clean the grain.

Carting Beer on Horseback in Chile.
Where the country is very hilly most articles are "packed" on horses or donkeys for transportation purposes, and the carter usually rides on the animal as well, no matter how heavy the load.

Although about three-fifths of the whole area of Chile is mountainous there are still over 70,000,000 acres of land suitable for agricultural pursuits, a very high proportion of the agricultural land is still covered with forest growth, enormous quantities of water from the melting snow of the Andes is available for irrigation purposes, and so the possibilities for extension of agricultural production are very great indeed. The principal agricultural area, known as the Vale of Chile, is over 600 miles long by about 60 miles wide, and as much of it is blessed with from 40 to 100ins. of average annual rainfall, possesses deep, rich volcanic soils, and has good natural drainage, enormous areas of first-class pastures will be developed some day, and water is so plentiful in the lower rainfall portions that a great extension in fruits and vines can be anticipated for the future.

The climate of Chile being in the main what is known as Mediterranean climate, water for irrigation being really plentiful, and considerable areas of fertile soils with good natural drainage being available, it appears certain that in the future this country will be a very important producer of wine, fruits, olive oil, nuts, dairy produce, and mutton (lambs), as well as produce fair quantities of cereals, legumes and maize.

At present the principal agricultural productions of Chile consist of wheat, oats, beans, barley, maize, vines, vegetables, pastures, and farm livestock, and quite a considerable proportion of the area sown to most crops is irrigated. The following tables give the area of the principal crops grown, the proportion irrigated of most of the crops, and the numbers of the various kinds of livestock maintained in the country:—

Area of Principal Crops and Proportion Irrigated—Chile, 1929-30.*

Crop.	Area Sown.		Percentage Irrigated.
	Total.	Irrigated.	
	Acres.	Acres.	%
Wheat	1,723,880	373,538	21·7
Oats	297,371	9,334	3·1
Barley	152,108	96,239	63·3
Rye	8,445	1,835	21·7
Canary seed	768	840	83·3
Maize (for grain)	93,733	64,252	68·5
Maize (for silo)	13,234	?	?
Beans	164,248	123,769	75·4
Vetches and Peas	52,008	4,100	7·9
Lentils	35,919	5,664	15·8
Chick peas	14,541	1,371	9·4
Potatoes	105,289	36,850	35·0
Vines	193,129	73,389	38·0
Lucerne (for pasture)	234,003	?	?
Lucerne (for seed)	4,807	?	?
Clover (for pasture)	234,714	?	?
Clover (for seed)	11,033	?	?
Atriplex	17,475	?	?

* Sinopsis Geográfico-Estadística de la República de Chile.

NOTE.—In translation hectarea taken as 2.47 acres.

Number of Domesticated Livestock in Chile.

Year.	Cattle.	Sheep.	Pigs.	Horses.	Asses and Mules.	Goats.
1908	2,303,659	4,224,266	216,360	516,764	83,092	343,810
1913	2,083,997	4,567,194	184,222	489,073	64,796	288,056
1918	2,225,323	4,434,115	326,337	411,437	90,250	451,941
1922	1,995,538	4,569,166	263,330	329,454	77,396	525,106
1925	1,918,433	4,093,872	246,636	323,581	67,551	357,023
1930	2,387,940	6,263,482	331,156	441,027	68,869	788,831

* Sinopsis Geográfico-Estadística de la República de Chile.

EXPORTS OF AGRICULTURAL PRODUCE.

Although the agricultural exports of Chile have not yet reached very considerable dimensions there are very few of the agricultural products suitable to the natural conditions which are not being exported to some extent, and now that agricultural production is being encouraged in the country some of the kinds will soon be very important indeed. At present the principal items being exported are wine, cereals (barley and oats), legumes (beans, peas, and lentils), onions (onions and garlic), melons (mainly sweet melon), apples, wool, meat (sheep), hides, and honey. The next table gives details of the principal agricultural exports, and the progress made since 1928:—

*The Principal Agricultural Exports of Chile.**

Product.	1928.	1929.	1930.	1931.	1932.
	Tons.	Tons.	Tons.	Tons.	Tons.
Wheat	11,583	63	38,947	1,090	39
Barley	55,983	51,059	43,117	14,545	19,492
Oats	51,346	45,911	58,147	59,751	12,468
Rye	1,471	649	413	177	76
Beans (Kidney)	40,065	22,255	24,490	15,098	7,861
Vetches and peas	7,758	7,282	6,692	7,049	5,374
Lentils	6,968	6,386	12,544	9,743	7,132
Chick peas	2,519	2,004	1,745	1,973	1,571
Hemp seed	782	17	248	1,025	609
Potatoes	1,669	1,213	797	486	760
Onions	7,037	6,185	2,325	531	8,164
Garlic	3,962	3,465	4,471	2,380	3,066
Melons	736	1,101	1,727	3,381	3,161
Apples	1,993	3,333	2,869	2,735	4,366
Pears	55	199	146	—	23
Peaches	27	58	134	66	192
Plums	15	45	87	2	216
Cherries	32	57	53	51	38
Grapes (fresh)	310	14	87	82	196
Grapes (dried)	188	264	194	234	269
Nuts	2,138	2,896	1,902	1,086	2,228
Clover seed	90	209	68	134	697
Wool	11,883	10,469	8,952	9,879	11,179
Meat (frozen)	19,448	18,745	17,314	12,678	14,354
Hides	6,301	3,967	4,388	5,370	7,163
Intestines (salted)	805	709	563	491	765
Honey	1,831	1,801	1,553	1,299	2,333
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Wine	1,208,460	835,560	1,257,520	1,017,280	1,295,800

* Sinopsis Geográfico-Estadística de la República de Chile.

NOTE.—In translation tonelada taken as 0.9842 ton, and litro as 0.22 gallon.

WINE IN CHILE.

The growth of vines and the manufacture of wine have been practised on an extensive scale in Chile ever since the original settlement of the country by the Spanish, and the natural conditions of much of the country are so suitable for wines, and the founders of the industry were so highly skilled, that Chile has been noted for a very long time as a producer of wines of extremely fine quality. Other than minerals (most metals, nitrate of soda, sulphur, &c.) the production of wine is the most important industry of Chile, producing as it does much wealth for the country, and employing a lot of labour. In 1934 the vineyards registered consisted of 34,594 holdings, and covered an area of 211,484 acres, and as most growers make their own wine considerable capital is invested in the industry, and the labour requirements are very great, for much of the cultivation work is done by hand hoes, and where teams are used they almost invariably consist of yokes of two bullocks only.

The production of wine fluctuates between 50,000,000galls. and 74,000,000galls. per year, and as the export of this article only reaches about 1,500,000galls. a year, the consumption of this beverage is fairly high in Chile.

*Production of Wine in Chile.**

Year.	Area of Vineyards.†	Wine Manufactured.	Wine Exported. ‡
	Acres.	Gallons.	Gallons.
1906-07	108,606	25,376,560	—
1911-12	—	43,216,360	—
1916-17	157,709	51,529,940	—
1921-22	—	73,553,260	—
1926-27	201,256	67,868,240	969,411
1930-31	193,129	53,322,060	1,044,791
1931-32	190,511	53,044,640	1,295,833
1932-33	—	67.719.170‡	1.478.749

† About 38 per cent. of vineyards are irrigated.
* Sinopsis Geográfico-Estadística de la República de Chile.
‡ Figures supplied by Department of Agriculture.
NOTE—In translation hectarea taken as 2.47 acres, and litro as 0.22 gallon.

Delivering Milk on Horseback in Valparaiso.

Besides doing so much of the heavy transport work on pack horses and pack donkeys, milk is delivered to consumers on horseback in the steeper towns of Chile, the distributor invariably riding between the milk cans.

The vineyards of Chile are located in the middle Provinces of the country, nearly all of them being within the boundaries of Santiago, Colchagua, Talca, Maule, Nuble, Concepción and Bío-Bío. In the northern of these Provinces the vines are irrigated, but in the south the rainfall is ample to promote full, luxuriant growth. About 38 per cent. of the total area of vineyards is irrigated, and as the soils have good natural drainage, and fresh water from the melting snow of the Andes is plentiful, water is liberally applied, even to the extent of irrigating the vines every 12 to 15 days throughout the period of October to April. This practice has been followed for a very long time, and in a really hot Mediterranean climate, still the texture of the soils and the quality of the water are such that there are no signs of a rise of excess of injurious salts.

The cultivation of most vineyards seen was really good, particularly in the larger ones, and as so much of the cultivation is done by hand hoes neither odd corners nor single weeds are missed, and the holdings have a neat and tidy appearance. In the irrigated areas the growth made by the vines is very regular, but farther south many of the vineyards are irregular and some quite poor.

Chile is in the fortunate position of being free from Phylloxera, and so retains the advantage of cheap establishment of vineyards, full regular growth, and long life of the vines, and a continuance of the special qualities of well-known old-established brands of wine.

About 70 per cent. of the wines are red and the remainder white, and the great majority of them are of low alcoholic content That their quality is good is generally recognised and the best of them are considered by experts to be among the highest-class wines of the world. Champagne of good quality is made in Chile, both by the traditionally-correct single-bottle method, and in bulk by the most modern methods developed in Europe.

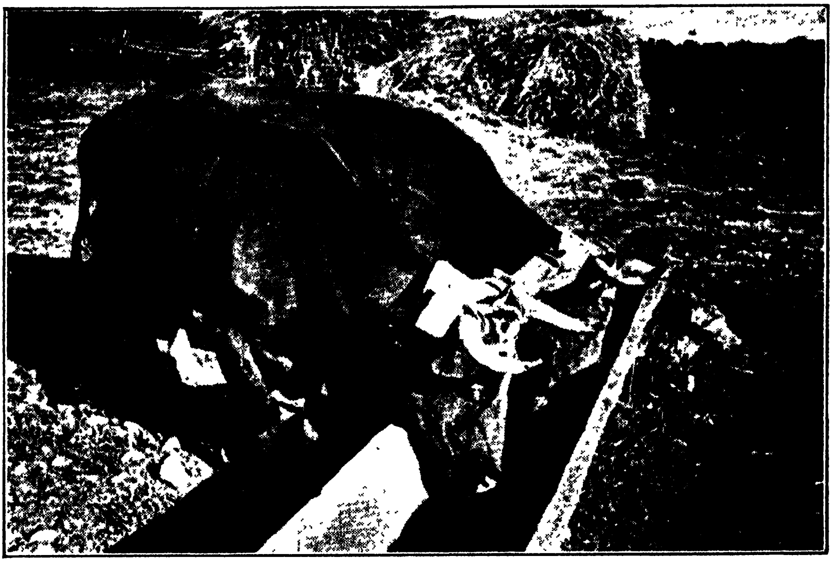
Home-Made Bullock Dray, as Commonly Used in many Country Districts of Chile.

Drays to be hauled by a pair of bullocks are general throughout Chile, and in many places are made from timber available on the farm or in the locality. The wheels are a simple section of a log, and even the axles are of wood. Axles do not last long, and are replaced by similar kinds as they wear out.

Exports of wine from Chile are on the increase, the principal countries buying them being Belgium, Germany, Holland, the neighbouring countries in South America, and the United States of America.

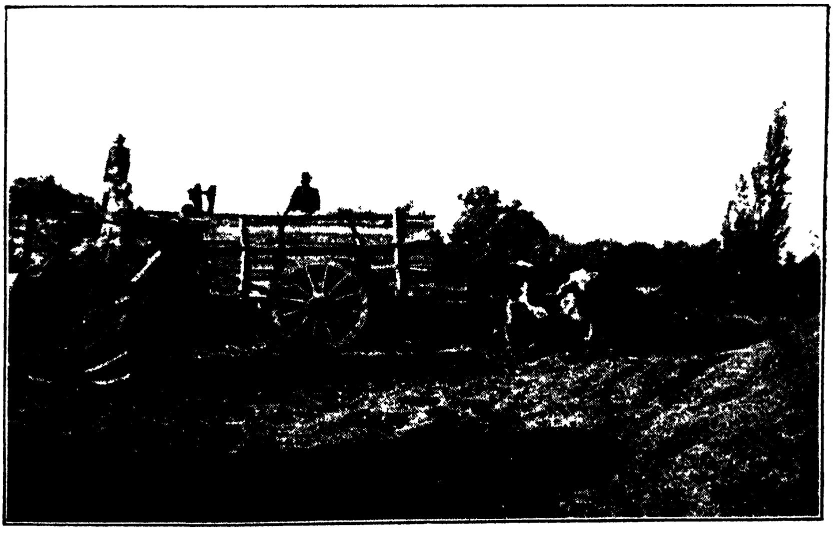
FRUIT-GROWING IN CHILE.

The growing of fruits suitable for a Mediterranean climate has always been important in Chile, but since the export of the fruits has been undertaken under proper methods a great increase in the area planted has taken place, and it can be confidently expected that this country will eventually become a really prominent producer of certain fruits. As to be foreseen, grapes, olives, almonds, figs, apricots, peaches, nectarines, apples, pears, cherries, plums, and walnuts do well in some portion of such a country, with its climate varying from rainless, through semi-arid to Mediterranean, and shading into cool temperate with heavy rainfall. At present grapes are important from an export point of view for wine, dried grapes and fresh grapes, and a lot of apples and walnuts are sold out of the country, and although the exports of other kinds of fruit have not yet reached considerable dimensions some of all kinds is sent away, and the quantity is increasing year by year.



Looking on Top of Yoked Bullocks to Show the Method of Attaching Yokes to Horns.

Each yoke is specially made for the pair of bullocks to which it is to be attached, the grooves to take the greenhide thongs being so placed that the yoke is kept off the necks of the animals when tightly laced to the butts of the horns.



The Primitive and Modern.—A Two-Bullock Dray Brings the Crop to be Threshed to a Power Thresher, Driven by an Up-to-date Tractor.

In the cooler parts of Chile the conditions are too cool for the effective tramping out of the grain from the crops, so power threshers are used, although most other harvesting operations are still conducted along primitive lines.

The Government has opened fruit-canning schools, where suitable pupils are taught modern methods of canning fruit. Good quality fruit is grown in the country and the authorities are endeavouring to ensure that the surplus which already exists will be presented to prospective buyers in an attractive as well as a wholesome form. The canned pears and peaches tasted at the canning school were of good texture and flavour, and were excellently preserved.

CEREALS IN CHILE.

Although Chile is, in a general way, a hilly to mountainous country, a fair quantity of the more important cereals is grown. At one time enough wheat was produced to enable a handy surplus to be exported, but this has dwindled to such an extent that the country is just about self-supporting with this cereal. The crop of barley and oats is always in excess of local requirements, and somewhere between 12,000 and 60,000 tons of grain of each cereal is available for export each year. A large increase in the area sown to wheat, barley, and oats was brought about between 1909 and 1914, but since that time relatively little increase has taken place, as can be seen in the next table:—

A Busy Harvest Scene in Chile.

Sheaves of a ripe wheat crop have been carted to a thresher in a bullock dray, and many hands are required to conduct the threshing operations.

Progress of Cereal Growing in Chile.

	Wheat.		Oats.		Barley.	
	Area.	Yield.	Area.	Yield.	Area.	Yield.
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
1909	839,800	19,642,300	46,930	2,029,500	83,980	3,502,400
1914	1,074,450	18,960,300	150,670	5,670,500	140,790	4,865,200
1919	1,195,480	19,873,300	64,220	2,068,000	125,970	3,537,600
1924	1,427,660	24,420,000	133,380	3,641,000	163,020	4,756,400
1929	1,724,060	33,458,300	296,400	8,305,000	153,140	4,395,600
1932	1,464,710	28,684,300	170,430	5,654,000	155,610	6,344,800
1933	—	26,000,000	—	—	—	5,800,000
1934	—	32,000,000	—	5,750,000	—	6,000,000

NOTE.—In translation hectarea taken as 2.47 acres, and metric quintal as 220lbs.

YIELDS OF THE CEREALS.

The yields received from the cereals in Chile are not comparable to those of most other countries, because so much of the wheat and barley crop is irrigated, in the case of the former it is about 22 per cent., and of the latter as high as 63 per cent. For the twenty-four year period ending in 1933 the relatively high average yields of 17bush. 50lbs. per acre for wheat, 30bush. 10lbs. per acre for oats and 31bush. 20lbs. per acre for barley have been recorded, details of which are to be seen below:—

*Yield per Acre of Principal Cereals in Chile.**

Year.	Yield per Acre.					
	Wheat.		Oats.		Barley.	
	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.
1909-10	23	18	21	24	41	33
1910-11	18	42	34	38	38	5
1911-12	20	29	38	39	30	5
1912-13	21	23	35	25	33	32
1913-14	16	11	29	7	34	44
1914-15	17	40	37	16	25	49
1915-16	17	40	31	16	34	18
1916-17	17	40	35	7	37	1
1917-18	17	40	31	33	23	16
1918-19	16	38	31	33	32	2
1919-20	16	38	32	2	28	6
1920-21	18	25	31	33	33	32
1921-22	16	20	32	37	30	49
1922-23	17	31	27	33	31	25
1923-24	18	16	31	6	32	20
1924-25	17	4	27	15	29	19
1925-26	18	25	30	37	33	32
1926-27	15	44	28	28	27	47
1927-28	16	38	26	10	28	33
1928-29	17	13	25	32	30	22
1929-30	19	27	28	1	28	33
1930-31	17	13	21	6	22	21
1931-32	13	57	23	32	27	47
1932-33	17	49	30	2	36	33
Means, 24 years	(*a*) 17	50	(*b*) 30	10	(c) 31	20

(*a*) About 22 per cent. irrigated. (*b*) About 3 per cent. irrigated. (*c*) About 63 per cent. irrigated.

* Sinopsis Geográfico-Estadística de la República de Chile.

NOTE.—In translation hectarea taken as 2.47 acres, and metric quintal as 220lbs.

TYPES OF CEREALS GROWN IN CHILE.

The wheats and barleys grown in Chile are almost identical in type to those grown in Australia. Of wheats about 95 per cent. are "white" wheats quite similar to Australian varieties, and as a matter of fact some of our well-known kinds are prominent in Chile, notably Florence and Australiana (probably Currawa), whilst Major and Waratah were also seen. The remaining 5 per cent. of wheat consists of red wheats similar in type to those found in Argentina. Of barleys, about 63 per cent. are six-rowed "feed" kinds very similar to those known as Cape, Malting Cape, Six-rowed, &c., in Australia, whilst the remaining 37 per cent. consists mainly of Chevalier type malting barleys, somewhat like Prior.

Most oat crops seen were of the heavy-yielding European types of a white or almost-white colour, and as the oat crops are grown towards the south, where the rainfall is sufficiently heavy for this cereal and irrigation is unnecessary, there is no need for Chile to grow the Algerian type of oats so suitable for the semi-arid areas of Australia.

Opening-Up Furrows for Irrigation in a Crop with a Single-Handled Plough Drawn by Two Bullocks.

In Chile most of the cultivation work connected with crops, which is not done by hand implements, is carried out by teams of two bullocks with yokes attached to the animals' horns. The principal implement seen in many parts of the country is a wooden plough made from a bent limb of a tree, and shod with iron, the implement being almost as primitive as those used in Bible times.

A little rye is grown in Chile, but it is not an important crop in any way, and it does not appear as though it will ever occupy a prominent position among the crops of the country.

Types of Wheat and Barley Harvested in Chile in 1931-32.*

Type of Crop.	Total Yield.	Percentage.
	Bushels.	%
Wheat—		
Very white	1,214,092	5·7
White	18,847,664	89·2
Red	1,081,135	5·1
Barley—		
Feed	1,877,964	63·3
English Malting	909,445	30·7
Chilean Malting	179,388	6·0

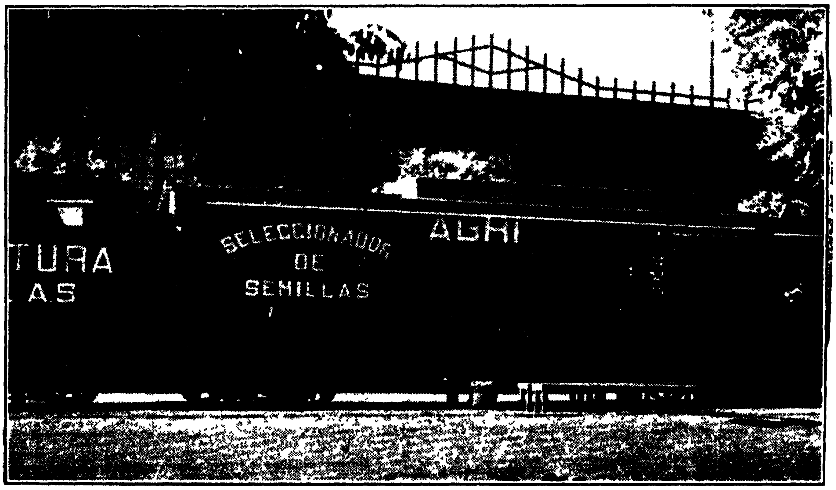
* Sinopsis Geográfico-Estadística de la República de Chile.

NOTE.—In translation metric quintal taken as 220lbs.

HARVESTING CEREALS IN CHILE.

A great deal of the harvest work connected with the collection of the cereal crops is still carried out in a most primitive fashion. Much of the crop is cut with the sickle when ripe, is tied into large sheaves which are stood up on their butts, not in stooks as binder-made sheaves are packed, but each one separately. When dried right out they are stacked on the threshing floor in a circular stack, and then a fence is erected parallel to the edge of the stack and some few yards away from it. When the crop is being threshed unharnessed farm animals are driven round and round the space between fence and stack and men and women throw sheaves of the crop from the stack under the feet of the moving animals. When the grain has been tramped out of the heads it is winnowed by throwing or brushing it into the wind.

Power threshers are used in large numbers in the cooler parts of the country, as the crops are heavy and the ground and climate too cool and damp for the effective tramping out of the grain. It is a common sight to see the primitive and modern side by side at harvest time; crops cut with sickle, carted to thresher in a home-made bullock-dray with wooden axles, drawn by two oxen, and the threshing done by an up-to-date thresher driven by a powerful motor tractor.



Grain Graders Mounted on Railway Cars on the State-Owned Railways of Chile.

These grain graders are taken through the wheat-growing districts of the country grading agricultural seeds for farmers at a low cost. Besides these, the Department of Agriculture of Chile has several of the same make of grain grader, mounted on motor lorries, to grade the seeds of farmers located some distance away from the railway lines.

Binders are used to cut the cereal crops on some farms but their use is by no means general in the country. It will probably be some time before truly modern methods are utilised to the full, because there is a large rural population in Chile which at present gets its living by farm work, and until many of the persons can be absorbed in other jobs, full advantage cannot be taken of modern farm machinery.

ENCOURAGING CEREAL GROWING.

The Government is doing everything possible to encourage farmers to improve their crop-growing practices, and is particularly interesting itself in the improvement of cereal growing. Besides opening up cereal breeding and crop selection stations, well equipped and adequately staffed, from which to distribute better quality seed, the Department of Agriculture sends grain grading machines throughout the agricultural districts, and grades the farmers' seed at a very low cost. Enclosed railway cars have been equipped with "Petkus" grain-grading machines, and three of these tour all of the cereal growing districts served by railways, while seven similar plants have been fixed to motor lorries to help grain growers located some distance away from the railway lines. Farmers have taken very kindly to the scheme and officials are looking forward to a noticeable improvement in the cereal crops as the result of this work.

VEGETABLES IN CHILE.

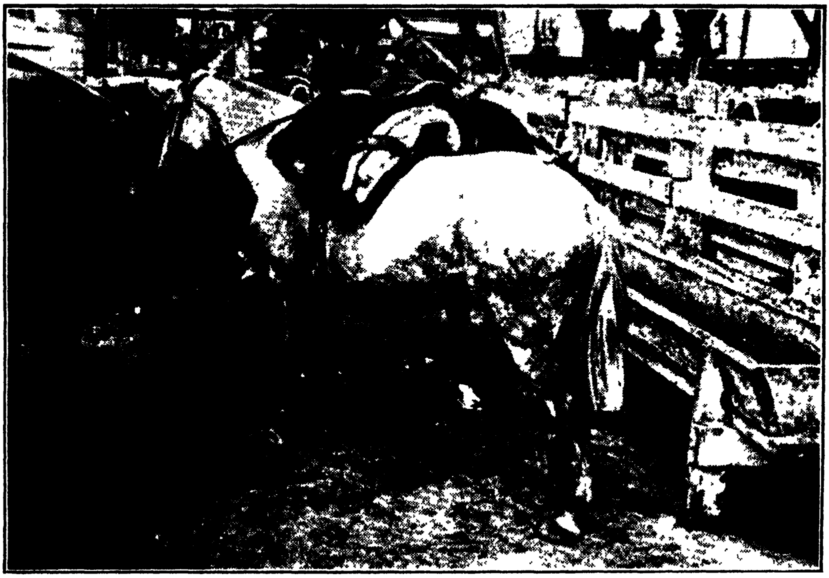
Enormous quantities of vegetables are grown in Chile, and market gardeners are quite expert at their calling. Kidney beans are the staple diet of the populace, and as large quantities are exported as well, the area planted with this crop is considerable indeed, and as a matter of fact almost everywhere in Chile where crops are grown beans appear very prominently. About three-quarters of the area sown is irrigated, but in those southern districts, where frosts admit of the crop, sufficient rain is received to mature heavy crops of beans. A large assortment of varieties is grown, all of which are good human foodstuffs. Besides beans, peas and lentils are produced in large quantities, both for local consumption and for export, and although a fair proportion of the area sown to lentils is irrigated, nearly all of the peas are grown where the rainfall is sufficient. Onions are used in large quantities in the country and a good export trade to the United States of America is being worked up with onions and garlic. Of recent years sweet melons have been grown most successfully, and as well as the great quantity consumed locally, exports, mainly to the United States of America, have reached thousands of tons a year. Considering that the potato is indigenous to Chile, it is to be expected that large quantities would be produced in the country, and for local consumption it is so, but the amount exported is not very great. The tubers offered for sale in the markets were very small indeed, and not of the quality of the onions and melons, which was very high. Chillies, or *Capsicums* from which cayenne pepper is made, are consumed in enormous quantities, both green and ripe, and the quality of those exposed for sale was invariably good.

OTHER CROPS.

Although practically all crops suitable for the conditions are grown in Chile, few others than those already mentioned have yet reached a prominent position. Of the others, maize has been an important crop for a very long time, as maize grain is one of the principal foods of certain sections of the people, and a fairly considerable area is sown for green forage and silage each year. All told, over 100,000 acres are sown yearly, and most of it is produced with artificial irrigation. Hemp growing is becoming popular in the country, and under irrigation it does well in the conditions. Quite a fair amount of hemp seed is exported each year. Strawberries, which are indigenous to southern Chile, are grown to some extent, but do not appear to be nearly so popular, in this their natural habitat, as they are in some countries which have adopted them as a fruit. Red clover does particularly well in portions of the country, and appears as if it will become increasingly important as the forest growth is removed from the volcanic soils in the heavy-rainfall districts of the south.

IRRIGATION IMPORTANT IN CHILE.

It is estimated that about 3,000,000 acres are farmed with the aid of irrigation by private people, and that about another 1,000,000 acres, which are under Government schemes of some kind, are also artificially watered. To Australians these figures are immense and give some idea how very important irrigation is to Chile, but judged by the enormous quantity of perfectly fresh water from the melting snow of the Andes which finds its way to the sea in almost countless small streams, as well as in a few fair-sized rivers, there are very great possibilities of expansion of irrigation farming. Portions of most valleys in the area which extends a couple of hundreds of miles north and south of Valparaiso, are growing crops with irrigation, the water being conveyed in open earth channels contoured to take the water wherever it will run. A large assortment of crops is raised with the help of water, the principal ones being vines, fruits of several kinds, beans, lucerne, maize, barley, potatoes, and vegetables of most kinds. Near the city of Santiago, included amongst the vegetables, are large areas of Globe artichokes on quite a number of holdings, and some gardens appear to grow little if anything other than this crop. Much of the land in this relatively low-rainfall area consists of free-working soils of high fertility resting on coarse water-worn gravels, and so has good natural drainage, but on the other hand, because of the looseness, requires frequent and liberal waterings. Most of the irrigation settlements are fairly old, still there is no evidence of an excessive rise of injurious salts, the water being so fresh and the natural drainage of the soils so good that this trouble, so common in hot, semi-arid climates, does not operate. In some localities red clover is grown as well as lucerne, and numbers of farmers prefer the clover to the lucerne, both on returns and on the quality of the feed.

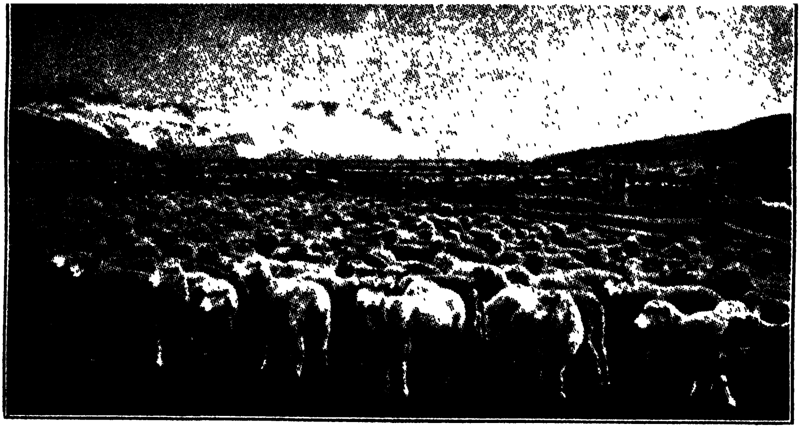


Stock Horses, showing Typical South American Saddles.
The saddles consist of a framework on which are packed three or four sheepskins, kept in position by a surcingle. These saddles are veritable leg-spreaders, but for country stockmen provide useful beds when spread out after unharnessing the horses.

WEEDS SEEN IN CHILE.

The weeds seen along the roadsides, on farms, and in gardens are identical with those commonly found in southern Australia, and their presence is a true indication of the similarity of the climates of the two countries. In the southern districts, where the rainfall is heavy, the Blackberry (*Rubus fruticosus*) is extremely bad, growing so strongly in some localities that it is competing with the natural forest. Bathurst Burr or Horse Burr (*Xanthium spinosum*), which is indigenous to the country, and Bindweed (*Convolvulus arvensis*) are two troublesome weeds in several localities. Of weeds well known in Australia the following were seen in great quantities:—Wild Oats (*Avena fatua*), Barley Grass (*Hordeum murinum*), Sea Barley (*Hordeum maritimum*), Fennel (*Foeniculum vulgare*), Rooted Cat's-ear (*Hypochoeris radicata*), Chicory (*Cichorium intybus*), Wild Artichoke (*Cynara carduncnlus*), Saffron Thistle (*Carthamus lanatus*), Variegated Thistle (*Silybum marianum*), and Docks (*Rumex* spp.), whilst lesser quantities of Water-couch Grass (*Paspalum distichum*), Purslane (*Portulaca oleracea*), Petty Spurge (*Euphorbia peplus*), Wild Turnip (*Rapistrum rugosum*), and Buchan Weed (*Brassica adpressa*), were encountered in several localities. There was a noticeable absence of leguminous plants amongst the weeds, the only one noticed at all in the drier parts of the country, and that in gardens only, was King Island Melilot (*Melilotus indica*). In the southern end of Chile where the rainfall is heavy, Red Clover, White Clover, and Cocksfoot are behaving as strong-growing weeds, as they do in parts of New Zealand.

A Flock of Pure-Bred Corriedale Sheep at "Chacabuco," in Chile.
Corriedale sheep are doing well in parts of Chile, and fairly large numbers of high-class animals of the breed have been imported from New Zealand into the country in recent years.



[From *Bulletin of the Pan American Union.*

A Flock of Sheep Typical of the District of Magallanes, in the South of Chile.
Nearly half of the sheep of Chile are maintained in the Magallanes district, and from this part of the country about 60 per cent. of the wool is produced, as well as nearly all the carcasses of mutton and lamb which are exported overseas.

SHEEP IN CHILE.

There are about 6,500,000 sheep in Chile, of which number about 40 per cent. are maintained in the Magallanes district to the south of the country. Very few Merino sheep are kept, but long-woolled breeds like Lincolns and Romney Marsh are prominent, and Corriedales have been imported in large numbers of recent years from New Zealand. Sheep breeders in Chile had just commenced to take a serious interest in flocks of Merinos, but the imposition of the embargo on the exportation of stud Merinos from Australia reduced the chances of the breeders making rapid progress in the improvement of the local sheep of the breed. Some of the country of Chile is ideally suited for Merinos, having Mediterranean climate, being of a hilly nature, and possessing red-coloured, heavy-textured soils of high fertility.

The census of 1930 disclosed that the 4,600,000 sheep shorn that year produced 26,680,000lbs. of wool, and of this quantity about 60 per cent. came from Magallanes, at the extreme south of Chile. Practically all of this wool is of coarse texture, and not comparable to that from Merino sheep.

CATTLE IN CHILE.

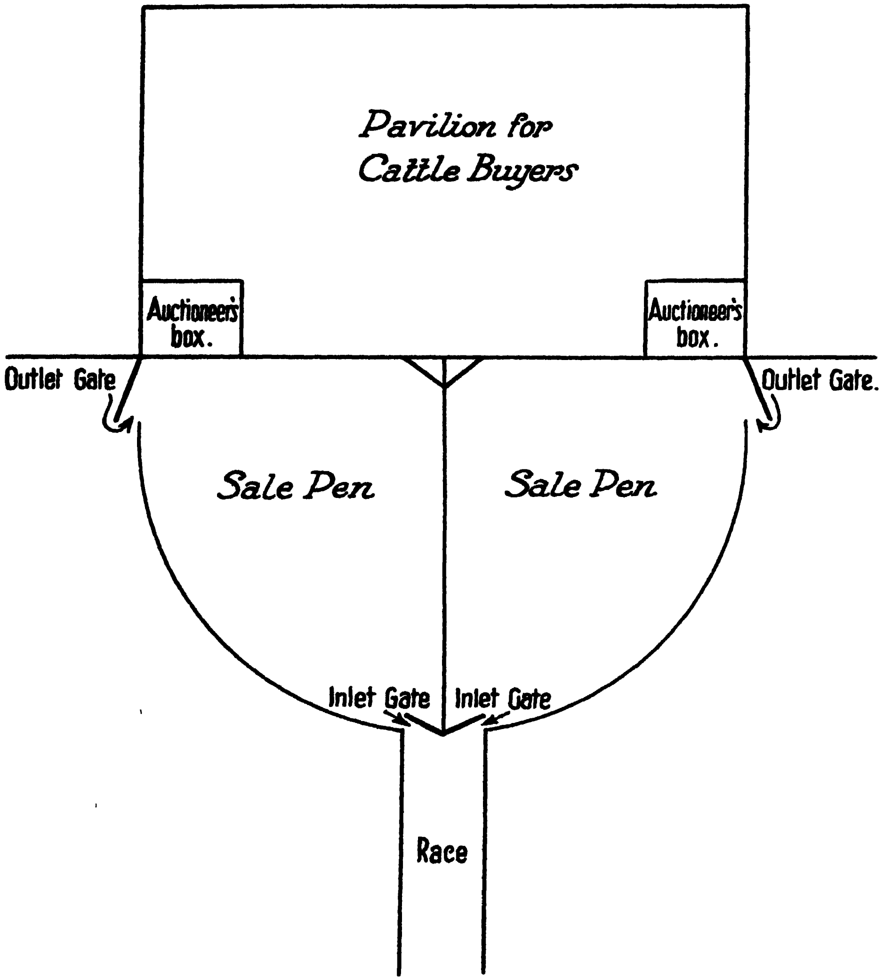
Although it is freely stated that Chile is a good cattle-producing country she does not breed sufficient animals to supply her own beef requirements, and importations from over the border are necessary. Considering the natural conditions obtaining in the country this is to be expected, and when strong-growing pastures are developed it will probably prove more economic to keep cattle for the production of milk rather than for beef, and to continue to import meat from the neighbouring countries where the conditions are so highly favourable for beef cattle.

Cattle Held Ready for Sale in a Pen in the Cattle Sale Yards at Temuco, Chile.

Papers with printed numbers on them are stuck on the top of the hindquarters of each beast before sale, which does away with the job of marking the animals with paint or tar after they are sold. The square papers can be seen on several of the cattle in the illustration.

There are about 2,500,000 head of cattle in the country, which is only a slight increase in numbers during the past 25 years or so, and of these the animals kept for dairying purposes are largely of the Friesian breed, whilst the beef cattle are mixtures of various kinds, a high proportion appearing as though more suitable as work oxen than as producers of quality beef.

A convenient and rapid method of selling bullocks one at a time is practised in Temuco, a fair-sized country town in the south of Chile, and is rendered possible by the arrangement of the selling yards. Cattle buyers sit in a rectangular pavilion with seats banked steeply one above the other, at the front of which are located two selling yards, each being half the width of the pavilion, and are rounded and in shape somewhat like a quarter of a circle. At each of the front corners of the pavilion is an auctioneer's box, the ground plan of the pavilion, sale pens, and auctioneer's boxes being as follows:—



Ground Plan of Cattle Saleyard at Temuco, Chile.

Not to Scale.

A beast is brought into one sale pen and the auctioneer overlooking that pen calls for bids, and whilst selling that animal another is brought into the other sale pen. As soon as the first animal is sold the other auctioneer commences selling the beast in his yard, and this goes on alternately. In each sale pen is stationed a cattle drafter on horseback, and the horses used are very expert in helping to keep the animals towards the buyers. The mucky job of branding the cattle with tar or paint after sale is eliminated at this saleyard, for paper numbers are stuck on the top of the hindquarters of all beasts some time before they are offered for sale. This has the added advantage of giving prospective buyers the certainty of knowing the animals when they come into the pen for sale after having leisurely inspected them beforehand. The papers carrying the numbers are about 5in. square and the figures about 2in. in height.

DAIRY PRODUCTS IN CHILE.

The census of 1929-30 showed that there were 282,415 milking cows in Chile, and that during the year 60,454,020galls. of milk were produced. Of manufactured dairy products 3,442 tons of butter and 2,458 tons of cheese are recorded

A Corner of a Modern and Up-to-Date Milking Shed at Los Andes.
Although much of the agriculture of the country is conducted on primitive lines, some of the properties are most efficiently managed. The sheen of the floor of the shed illustrated, with the piping framework and fittings, swivel bails, and cement concrete feeding troughs, show modernity of equipment and efficiency of management.

for that year in Sinopsis Geográfico-Estadística de la República de Chile. Since that time considerable progress appears to have been made, and this largely because of the extension of large dairies, conducted by private individuals and syndicates on the most modern and hygienic lines. Although so much of the dairying of Chile is practised on very primitive lines some efficiently conducted dairies were seen, and one in particular (Baburizza and Pcrinovic's dairy farm at Los Andes) would be hard to fault, and especially the effort to keep down contamination of the milk in the milking shed. On arrival in the shed the whole of the hindquarters of each cow is washed and scrubbed with a brush from a line in front of the udder and over the back, including the hips, particular attention being given to udder and tail. When the last cow in the milking shed was washed, and not before, the milk girls, dressed in snow-white overalls, were allowed to commence milking, and throughout the period of milking youths patrolled the shed removing the droppings of animals as soon as evacuated.

A considerable change in the methods now followed in dairying by those conducting the business on a small scale will be necessary before Chile can become an important dairying country, but the possibilities for the development of luxuriant pastures in districts with mild climate are so great that eventually cheese, butter, casein, and other dairy products must be of great value in this Republic.

Other than a few crossbred animals practically all cows maintained on dairy farms are of the Friesian breed, and some exceptionally good animals are to be found in Chile. Breeders of Friesians keep up the standard of their herds by frequently importing bulls from Germany and the United States of America, some herdmasters preferring the stronger and more beefy Dutch type to the finer-boned more highly-strung American Friesians. Few high-production herds can be heard of in Chile, because it is a common practice to rear the calves on the cows, and so only a proportion of the milk produced by the cows is extracted by human beings.

SUMMARY OF IMPRESSIONS GAINED IN CHILE.

1. Chile is a long narrow country, being 2,661 miles in length, averages about 100 miles in width, and has a coastline of 2,800 miles.
2. About three-fifths of Chile is of a mountainous nature.
3. A large proportion of the north end of Chile is rainless or almost so, but the rainfall becomes gradually heavier and heavier towards the south, until over 120in. per annum are received in some localities.
4. In most parts of Chile where rain does fall, Mediterranean climate is experienced, and the bulk of the rain falls in the winter.
5. Rural practices are still very primitive in many districts of Chile, but on some of the larger holdings modern and thoroughly up-to-date methods are in use.
6. Although about three-fifths of the country is mountainous, there are still over 70,000,000 acres of land suitable for agricultural pursuits.
7. Possessed with Mediterranean climate, plenty of irrigation water, and considerable areas of fertile land, it appears certain that Chile will eventually be an important producer of wine, fruit, olive oil, nuts, dairy produce, and sheep, as well as raise fair quantities of cereals, legumes, and maize.
8. The principal agricultural items being exported at present are wine, cereals, legumes, onions, melons, apples, wool, and meat.
9. For a very long time, Chile has been noted as a producer of wines of extremely fine quality.
10. There are nearly 35,000 registered vinegrowers in Chile, and the area planted with vines is 211,484 acres.
11. The production of wine fluctuates between 50,000,00galls. and 74,000,000galls. per year, and exports reach 1,500,000galls. a year.

12. About ·38 per cent. of the vines grown in Chile are irrigated.

13. Since the export of fruits has been undertaken under proper methods a great increase in the area planted to fruit trees has taken place.

14. About 63 per cent. of the barley crop, and 22 per cent. of the wheat crop are irrigated.

15. The wheats and barleys grown in Chile are similar in type to those grown in Australia, but the oats are of European type.

16. A fair quantity of oats and barley is exported each year from Chile.

17. Most of the cereal crops are cut with the sickle, and a good deal of them are threshed by tramping with livestock, and then winnowed in the wind.

18. The Government sends grain-grading plants around the country districts to grade seed for farmers.

19. Enormous quantities of vegetables are grown and consumed in Chile. Beans are a staple diet of the populace, and large quantities of peas, lentils, onions, melons, and chillies are also eaten.

20. Maize has been an important crop of the country for years, and the grain forms one of the principal foods for certain sections of the community.

21. Red clover does particularly well in portions of the country, and is likely to become more important in the future.

22. Irrigation is practised on a considerable scale in Chile, and the possibilities of extending this type of agriculture appear to be very great.

23. Most of the weeds commonly known in southern Australia are prevalent in Chile, and their presence is an indication of the similarity of the climate in the two countries.

24. There are about 6,500,000 sheep in Chile, mostly of the long-woolled breeds, such as Lincoln and Romney Marsh, but Corriedales are gradually becoming prominent.

25. Chile possesses about 2,500,000 head of cattle, but has to import meat from across the border.

26. Except on some of the large holdings, most of the dairying of the country is conducted on primitive lines.

27. Other than for the presence of a few crossbred animals, practically all of the cows used for dairying purposes are Friesians.

FARMERS' DAY AT KYBYBOLITE.

Farmers' Day, which is held annually at the Kybybolite Experimental Farm, still attracts a large number of visitors from all parts of the South-East and the Western Districts of Victoria. This year's gathering, which took place on 13th November, was attended by approximately 300 to 400 farmers and graziers. Included amongst the visitors were the Minister of Agriculture (Hon. A. P. Blesing, M.L.C.), Messrs. Petherick, Hunt, Crosby, Connor, Dennison, and Dunks, M's.P., P. J. Baily and S. Shepherd (Members of the Advisory Board of Agriculture), Professor A. J. Perkins (Director of Agriculture), Dr. A. E. V. Richardson (Director Waite Institute), and officers of the staff of the Department of Agriculture.

Under the guidance of the Manager of the Farm (Mr. L. J. Cook), the visitors inspected the various experimental plots, and lectures were given by Dr. Richardson, Messrs. H. B. Barlow, R. C. Scott, and C. McKenna, B.V.Sc.

The Minister presented Mr. Shepherd with a Life Membership Certificate of the Agricultural Bureau.

VITAMINS AND OTHER FACTORS IN THE FEEDING OF BIRDS.

[By EDGAR W. PRITCHARD, Dip. Econ., Agricultural Botanist and Seed Analyst.]

There are six or seven vitamins at present known, but the following three are of great importance:—

1. *Vitamin A,* which keeps the eyes healthy.
2. *Vitamin B,* which is required to maintain a healthy nervous system.
3. *Vitamin C,* which prevents scurvy.

Taking the commoner bird foods:—

(1) Most seeds contain a little of Vitamin A, and are specially rich in Vitamin B.

(2) Green leaves of all kinds contain all three vitamins, as does also milk, if the cows receive some greenfeed.

(3) Fresh meat contains a small amount of all three, suet and beef fat some of Vitamin A, but none of the others, while liver is rich in all of them. The marrow of bones is also said to be rich in some of them.

(4) Of food for honey birds, white sugar and honey contain none, and brown sugar and treacle a little.

Seeds are by far the most important item of food for cage birds, for these are packed full of pure, concentrated, easily digested material, ready for the nourishment of the young plant, and equally suitable for the nourishment of birds and animals. But there is one important point about seeds which is often overlooked. It is that they should be fresh. The most highly nourishing part of the seed, especially from the point of view of vitamins, is the germ, the minute embryonic stem, root, and leaves, from which the young plant shoots. This germ is alive, though dormant, and in it is contained a small amount of Vitamin A.

But the germ only lives for a limited time, usually from five to 10 years, and after that, or even a year or two before, the seed is dead, and not fit for the nourishment of either birds or human beings. When dead, the seed begins to decay, mould fungi gain an entrance, the vitamins vanish, and the seed gradually becomes musty, and unpalatable, and in the end actually dangerous.

This is a point which needs careful watching, as some bird seed on the market is simply seed which was intended for sowing, but has been kept till it is too old to germinate, and is then thrown on the market as cheap bird seed. It can be truthfully said, that seed which is not fit to put into the ground to produce a crop is not fit food for man, animal, or bird.

To obtain an estimate of the real quality of the bird seed on the South Australian market, samples of seeds as they come in from overseas have been subjected to germination tests in the Seed Testing Branch of the Department of Agriculture. Following are some of the results, each figure representing a different sample:—

Germination of Imported Seeds.

	Per cent.
Hemp (from Japan and Manchuria) .	90, 82, 81, 78, 77, 75, 75, 52, 39, 16, 14, 6, 5, 0.
Canary (from Turkey)	99.
Millet (from Japan and Manchuria) .	100, 99, 92, 91, 88, 86, 83.
Sunflower (from South Africa)	92, 92, 90, 82.
Rape	77 (from Japan), 22 (from New Zealand).
Turnip (from New Zealand)	54, 28, 27.
Maw (from South Africa)	52.
Niger (from South Africa)	95.

No canary seed has been imported into South Australia from overseas for about three years.

All the lower results in this list showed much fungus growth, whereas the good samples were practically free from it. The poor quality of rape and turnip seed from New Zealand is very noticeable, because it is probably seed for sowing, which has become too old to pass the test.

From these results it will be seen that bird seed varies very considerably in quality, even when it is first imported, and it is certainly not likely to improve by keeping.

The next division is greenfeed, and this is the most important of all from the point of view of vitamins. Green leaves, both of herbs and grasses, contain all three of them. Greenfeed should be supplied fresh every day, because one of the vitamins is destroyed by drying, and besides, if left lying in the cage for any time, it will ferment, and thus become a dangerous poison, especially to birds which have lived in captivity for only a few generations.

Almost any kind of green grass, including millet and maize, will answer the purpose, and also such succulent herbaceous plants as kale, rape, cabbage, lettuce, silver beet, spinach, New Zealand spinach, clovers, peas, lucerne, and tree lucerne. There are also a few poisonous weeds, which should be carefully avoided. The worst of these is perhaps the Petty Spurge, a very fresh green succulent deceiver, with almost circular leaves, and minute yellow flowers. It is found in almost every suburban garden, and frequently grows among grasses and clovers and other green stuff. It can be identified by breaking the stem sharply across, when a milky juice will exude. This juice is a strong caustic poison. It will cure warts at one application, and will raise blisters on the hands in weeding, if it is at all plentiful. It should be avoided like poison. There are other species of spurge, with the same general appearance, but larger, and the same milky juice, which are all poisonous, but not so plentiful. Also all kinds of liliaceous plants, such as irises, daffodils, amarylis, watsonias, ixias, cannas, &c., should be avoided. They are all more or less injurious, though not so virulent as the spurges.

Next, we come to mixtures, of which I understand a certain amount is commonly used. The first and most important point from the point of view of vitamins is that, where wheat flour is an ingredient, it should be fresh, coarse ground wholemeal, and not the devitalised residue, which the housewife so much delights in for the production of her beautiful light fluffy spones. Wholemeal contains roughly *three* times as much lime, *five* times as much phosphates, and *four* times as much iron as white flour, and also a large amount of Vitamin B, of which white flour contains none at all. It has been proved that pigeons fed on white flour die quicker than if actually fasting. The same remarks apply to the majority of biscuits.

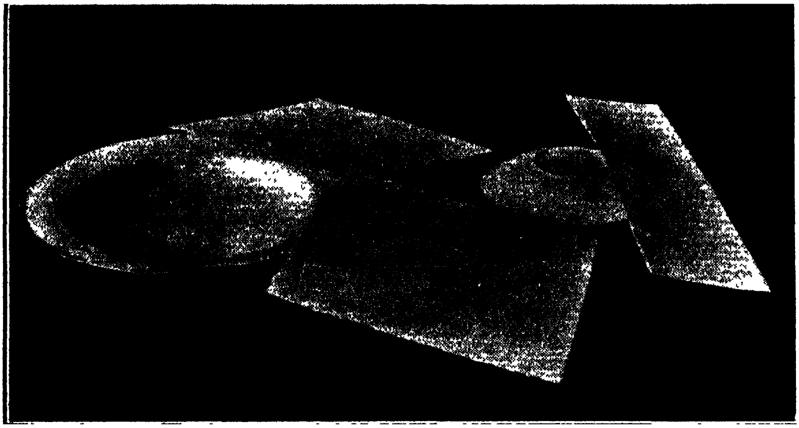
Also, the wholemeal should be freshly ground, if it is to represent adequately the whole wheat grain. All wheat contains a small amount of oil packed closely round the germ which begins to go rancid after about six weeks.

For honey birds, honey itself would seem to be the natural food. But it must be remembered that the nectar of the flowers is considerably changed in the honey sack of the bee, and during storage in the hive, being converted largely into fruit sugars. Nectar itself is almost pure cane sugar with the addition of some mineral salts, and probably some vitamins. Ordinary white sugar is too highly purified for the sake of appearance. So probably brown sugar would answer the purpose best. Honey is worth experimenting with, as it is at least pure, easily digested, and contains all the mineral salts of nectar.

The feeding of honey birds must, I should think, be rather a difficult problem, for most of them eat a large number of insects to balance up their diet. Nectar is wholly carbohydrate, and insects wholly protein and fat, so with the two combined, it is possible to get a balanced diet. It must, however, be difficult to provide live insects. And I can only suggest for trial, a mixture of brown sugar, 4ozs., and milk one pint, or brown sugar 4ozs., and raw egg (yolk and white) 6ozs., both diluted with water to the proper consistency. This would give a well balanced diet, and one easily digested by organs not accustomed to starchy foods. A small amount of fruits in season would complete the vitamin supply, and whole milk powder with a little dried or fresh orange juice, could be substituted for the fresh milk.

In regard to carnivorous birds, or those which live entirely on insects, the vitamin supply is really the most difficult problem. But with a fair supply of liver, and if possible, some bone marrow, the situation should be fairly secure. A little fresh whole milk should complete the security. Milk is the chief of what are called "the safety foods" in regard to vitamins.

Finally, as to practical methods of dealing with the food supply of birds, illustrated below is a home-made seed germinator. It consists of a porridge plate, a saucer, and some pieces of soft cloth or blotting paper. First, the narrow strip is folded round the saucer as shown; the saucer is then placed bottom upwards in the porridge plate, and water is added until the saucer is nearly covered. Then one of the squares is evenly moistened with water, and placed on the rim of the porridge plate, and pressed in the middle till it also touches the saucer. One hundred seeds are then arranged on the square, and covered with the second square, and the whole is put away in a cupboard which, if possible, should be well lighted. From five to 14 days are required for the final result, according to the variety of seed.



It is thus a simple matter to test all kinds of bird seeds for freshness, as well as for general qualities, such as the presence of shrivelled, old, and diseased seed. And it should surely be worth while, especially where seeds are bought in bulk. Seeds for sowing are required to give a germination of not less than that set out in the table below. The standard for bird seed should be nearly, if not quite, as high.

Germination Standards for Seeds.

	Per cent.		Per cent.
Barley	80	Niger	80
Canary	65	Oats	80
Hemp	65	Panicum	70
Linseed	65	Peas	75
Maize	80	Rape	70
Maw	80	Sunflower	65
Millett	75	Turnip	70
Mustard	60	Wheat	80

To summarise in a few words, the question of vitamins in the feeding of birds resolves itself into the following points:—First, making sure that all seeds are fresh and properly matured; second, a daily supply of fresh greenfeed; and third, for insect-eating birds a fair amount of fresh milk, and for carnivorous birds of fresh liver.

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THE PREPARATION OF EXPORT FRUIT.

[By E. W. REVELL, Fruit Inspector.]

During the past three or four export seasons, considerable improvement has occurred in the general appearance and get up of our export fruit. Attractive labels are being employed, and the standard case is now used almost exclusively; in so far as external appearance is concerned, exporters are submitting a good article, but there is undoubtedly still room for further improvement in preparation of the pack.

Every year an appreciable quantity of fruit is rejected by inspectors on account of well known defects such as—Black Spot, excessive hail-marks, Codling Moth, over-maturity, slack pack, bruising, &c., &c. Many such rejections could be avoided if the growers concerned would fully acquaint themselves with the requirements of the regulations, and then endeavour at all times to prepare a pack which is *superior* to that required by the regulations.

The necessity for careful picking has been stressed innumerable times, and yet many growers still pick fruit into unsuitable receptacles, and dump it from case to case with no appreciation of the damage they are doing. Bruising which can be traced back to the orchard is considerable, and is a frequent cause of shipside rejection. Even during packing operations much bruising may occur, and care should be exercised not to rush fruit so quickly through the grader that it is bruised in the process. Several lines of excellent Granny Smiths were rejected last season for bruising—some of the individual apples in these lines showed up to 14 separate small bruises—and the trouble was occasioned by rushed grading.

Strict and continuous supervision should be given to packers in order to ensure that fruit is not roughly handled at any stage. Individual apples or pears should be *placed* in position in the case with the absolute minimum of "thumping," and cases which have been packed too high should not be lidded in that condition on account of the bruising which may be so incurred. Whenever fruit does not approximate to the right height in the case, bruising or a slack pack will result, and it is always desirable to repack when fruit comes either too high or too low.

A large quantity of fruit is rejected every year for false labelling, and care should be taken that the particulars as to variety, size, &c., are branded correctly.

Corrugated cardboard, which is now used extensively in packing apples and pears, constitutes an excellent cover for pupating Codling grubs, and it is important that packed fruit be stored on clean floors, that Codling rejects should be kept right away from the packed cases, and generally, every care exercised to ensure that the grubs do not get into the cases after the fruit is packed. Last season, one submitted line of fruit showed heavy infestation of cardboard, one sheet alone containing over 60 grubs. Naturally, this fruit was rejected.

During transport of fruit to the wharfside, especial attention should be given to stowage on motor lorries; do not stack cases on the bulge; do not load so that cases overhang the sides of the truck, and above all, do not walk upon the cases.

The Stevedoring Companies who have the responsibility of loading our fruit on overseas boats have gone to much expense in providing special gear to prevent fruit from being damaged or bruised whilst being loaded. Walking boards are placed over the cases stowed in the ship's hold, and immediate action is taken by inspectors against any wharf worker for rough handling the fruit in any way.

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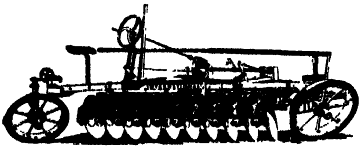
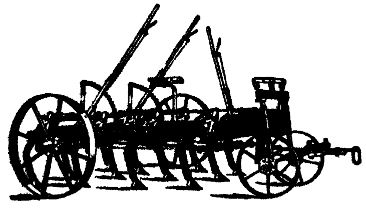
In the WD-40 triple-power tractor, McCormick-Deering engineers give the farmer the best he ever had in McCormick-Deering tractor quality—plus Diesel power that will cut the heart out of his fuel bills. Engine starts easily on petrol, switches automatically to low-cost Diesel fuel operation.



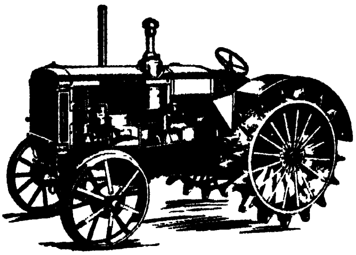
International Disc Cultivating Plough

McCORMICK-DEERING STUMP-JUMP MOULDBOARD PLOUGHS

These ploughs are built in 5 and 7-furrow sizes and can be adjusted to cut 6, 7 or 8-inch furrows. The jump beams or standards are one-piece high-quality steel with feet forged on the ends of the beams. These ploughs are supplied with short, medium, or long steel mouldboards, fitted with steel shares. For operation with tractor, a special power-lift attachment can be supplied at extra cost.



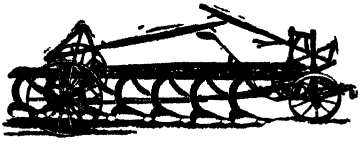
International Stump-Jump Scarifier



McCormick-Deering WD-40 Tractor

INTERNATIONAL DISC CULTIVATING PLOUGHS

The International single-jump disc cultivating plough is made in 6, 8, 10 and 12-furrow sizes, equipped with 22-inch discs spaced 9½ inches apart. A good plough for summer fallowing and ordinary ploughing. Width of cut can be varied from 5½ to 7 inches. This plough can be equipped for operation with horses or tractor.



McCormick-Deering Stump-Jump Mouldboard Plough

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Made in 5, 7, 9 and 11-ft. sizes, the International stump-jump scarifier has many serviceable features. It has ample clearance, is easy to operate—direct and positive in action. A splendid implement for cultivating fallow land. Can be equipped for use with horses or tractor.

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It is most disheartening that, despite these precautions against rough handling during loading of vessels, truck drivers, and even orchardists who have grown and packed the fruit, are occasionally seen walking over cases during unloading from a lorry. It should be pointed out that anyone at all who walks over packed fruit, or roughly handles it in any way, is committing an offence under the Prevention of Injury to Fruit Act, and is liable to incur penalties provided for in that Act.

SOME IMPORTANT POINTS.

1. Wire tie all cases on the side and not on the bulge
2. Keep the tie wires close up to the cleats.
3. Do not nail lids on a flat surface; place battens beneath the case.
4. Stencil or label cases with a *true* description of variety, grade, and count or size.
5. From orchard to ship, handle fruit with the greatest of care.
6. Do not walk or sit on packed cases.
7. Aim at the correct packing height; either tight or slack packing results, ultimately, in bruised fruit
8. Stack boxes on their sides, and not on the bulge.
9. Do not incur the expense of packing and delivering at the shipside fruit which will not comply with export regulations.

TOBACCO GROWING IN SOUTH AUSTRALIA.

[By R. E. C. Giles (Tobacco Instructor).]

The production of tobacco seedlings in South Australia has been facilitated during the present season by the adoption of the Benzol method, advocated by the Council for Scientific and Industrial Research. Prospects for the further development of the tobacco growing industry in the State are much brighter.

F. Kuhl's Experimental Plots of Dungowan and White Stem Orinoco, at Penola

The accompanying photograph was taken during December, 1935, on the plantation of Messrs. Johnson Bros. of Comaum, South-East. The seedlings were grown by the Benzol method and have made remarkable growth since transplanting from the frames.

The variety is Spotted Gum and the land was dressed with 3-8-3 tobacco fertiliser.

This photograph of tobacco after five weeks in the field was taken on the property of Messrs. F. Kuhl & Sons, of Penola, after the seedlings had been transplanted from the seedbeds.

Spotted Gun Tobacco Plants grown by Benzol method at Johnson Bros.', Comaun.

This is typical of the country in the South-East which is producing good, bright cigarette leaf. The soil is of a sandy nature, overlying a clay subsoil, which holds the moisture well.

With freedom from the Downy Mildew or Blue Mould disease, tobacco-growing should soon be a firmly established industry in this area.

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STATE OF SOUTH AUSTRALIA.

[A. W. BOWDEN, Government Statist.]

Artificial Manures used, 139,723 (148,923) tons for Crops; 17,466 (10,066) tons for Top-dressing (subject to slight revision).

Division.	Area under all Crops, &c.						Manure Used.					
	Total.			Per cent. Manured.			Total.			Average per Acre.		
	1932-33.	1933-34.	1934-35.	1932-33	1933-34.	1934-35	1932-33.	1933-34.	1934-35	1932-33.	1933-34.	1934-35.
	Acres.	Acres.	Acres.	%	%	%	Tons.	Tons.	Tons.	Lbs.	Lbs.	Lbs.
Central	1,090,834	1,063,301	1,013,872	89·33	88·63	87·97	44,219	43,001	41,801	101·7	102·2	105·0
Lower North	1,047,429	1,041,981	995,581	94·01	94·67	95·59	34,017	34,405	34,002	77·4	78·1	80·0
Upper North	435,613	389,963	334,921	53·19	61·38	63·53	5,780	5,999	5,760	55·9	56·1	60·6
South-Eastern	129,024	117,285	98,516	80·99	76·86	81·24	4,665	4,043	4,114	100·0	100·5	115·1
Western	1,307,627	1,321,299	1,213,222	82·41	81·09	77·12	28,325	27,658	24,390	58·9	57·8	58·4
Murray Mallee	1,156,129	1,144,729	973,270	89·55	92·28	90·17	33,794	33,808	29,656	73·1	71·7	75·7
Total State	5,166,656	5,078,558	4,629,382	85·32	86·37	85·32	150,800	148,923	139,723	76·6	76·1	79·2
Increase or decrease (—)	—53,214	—88,098	—449,176	4·60	1·05	—1·05	9,147	—1,877	—9,200	1·3	—0·5	3·1

Manures.—In addition to 139,723 (148,923) tons manure used for crops as above, 17,466 (10,066) tons were used for top-dressing; the acreage top-dressed being Counties Adelaide 48,125 (34,374), Carnarvon 7,611 (5,544), Hindmarsh 50.051 (36,886), Light 6,055 (4,925), Sturt 14,246 (10,805), Buckingham 26,248 (10,192), Grey 66,644 (31,029), MacDonnell 35,710 (18,651), Robe 70,066 (46,553), others 35,835 (13,042), total 360,591 (212,001).

NOTE.—The maximum percentage of cropped area manured was 92·62 in 1929-30, and the maximum quantity per acre was 93·1lbs. in 1926-27. The area of 360,591 acres top-dressed for 1934-35 was a record, the previous highest being 302,114 acres in 1929-30.

ORCHARD, VINEYARD, AND MISCELLANEOUS CROP STATISTICS, 1934-35.

[Figures in parentheses refer to previous season.]

I. ORCHARDS.

1. *Acreage,* 29,167 acres (28,899 acres); increase, 268 acres. Trees of bearing age, 25,841 acres (25,640 acres). Approximately 800 acres grubbed, mostly in Counties Adelaide, 460 acres; Hamley, 140 acres; Stanley, 25 acres; Albert, 35 acres; and Frome, 30 acres. New planting, 1,070 acres, was an encouraging feature, chiefly in Counties Adelaide, 800 acres; Hamley, 45 acres; Light, 50 acres; and Hindmarsh, 50 acres.

2. *Production.*—Generally speaking the crops were a little lighter than the previous year, due mainly to hail and frosts in the Murray areas and dry winter conditions during 1934:—(*a*) Apples, 800,768bush. (1,002,124bush.), a decrease of 201,356bush. (*b*) Oranges (calendar year 1934), 638,314bush. (582,602bush.); increase, 55,712bush., surpassed the record established the previous year. Lemons, 47,761bush. (49,028bush.). Other citrus, 6,398bush. (5,275bush.). (*c*) Pears, 175,966bush. (211,458bush.), decrease of 35,492bush. (*d*) Apricots, 359,816bush. (396,993bush.), a decrease of 37,177bush. below the record of the previous year. (*e*) Plums and prunes, 190,365bush. (150,539bush.), being 6,760bush. more than the previous record of 183,605bush. in 1927-28. (*f*) Peaches, 146,411bush. (147,175bush.).

Details for other fruits are shown in accompanying table.

II. VINEYARDS.

1. *Acreage.*—53,361 acres (52,880 acres); increase, 481 acres. Vines of bearing age, 51,220 acres (51,042 acres). About 650 acres grubbed or died out, chiefly in Counties Stanley, 60 acres; Light, 210 acres; Adelaide, 175 acres; River Murray districts, 110 acres; but this was more than counterbalanced by new plantings—about 1,130 acres—chiefly in Counties Light, 120 acres; Hamley, 380 acres; Adelaide, 370 acres; Albert, 80 acres; and Stanley, 60 acres.

The acreage was described as follows:—For winemaking, 33,159 acres (32,451 acres); drying, 19,847 acres (20,065 acres), and table, 355 acres (364 acres).

2. *Total Grape Yield,* 147,680 tons (130,889 tons); increase, 16,791 tons. Average per acre of bearing age, 2.88 tons (2.56 tons). For winemaking, 70,836 tons (54,865 tons); drying, 76,198 tons (75,329 tons), and table, 646 tons (695 tons).

3. *Wine Made,* 13,200,000galls. (10,032,012galls.); increase, 3,167,988galls.; and 2,101,084galls. above the average of the previous five seasons, 11,098,916galls. Wine figures are subject to revision.

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Commonwealth Savings Bank of Australia

(Guaranteed by the Commonwealth Government.)

III. DRIED FRUITS.

1. *Currants*, 185,173cwts. (160,356cwts.); increase, 24,817cwts., exceeding previous record of 164,145cwts. in 1928-29 by 21,028cwts.

2. *Raisins.*—Sultanas, 212,514cwts. (195,119cwts.); increase 17,395cwts., established a record, the previous best being 200,872cwts. in 1932-33. Other raisins, 32,165cwts. (54,484cwts.); decrease, 22,319cwts.

3. *Other Dried Fruits.*—Apricots, 20,095cwts. (20,623cwts.); plums and prunes, 11,423cwts. (8,286cwts.); peaches, pears, apples, &c., 9,361cwts. (12,341cwts.).

IV. MISCELLANEOUS.

Market gardens, 1,994 acres (2,105 acres). Pumpkins and melons, 308 acres (310 acres); 1,767 tons (1,819 tons). Tomatoes, 566 acres (485 acres); 184,067bush. (170,292bush.). Potatoes, 4,664 acres (5,824 acres); 19,377 tons (19,501 tons). Onions, 397 acres (417 acres); 2,993 tons (3,008 tons). Other root crops, 578 acres (584 acres); 3,244 tons (3,216 tons). Nurseries, 165 acres (168 acres).

V. OVERSEA EXPORTS.

The value of the total oversea exports of the products of vineyards and orchards for the year 1934-35 was £1,523,371 (£1,772,080); decrease, £248,709, the principal items being dried fruits, £656,944 (£822,782); wine, £731,081 (£702,392); apples, £85,269 (£183,732). Complete details of interstate exports are not available, but annually about £600,000 of wine and brandy are exported to the other States.

EGGS IN SHELL AND EGG PULP EXPORTS.

The grand total exports for each of the years 1930-31 to 1934-35 were, respectively, £156,632, £236,095, £342,915, £358,056, and £360,540. For the last year, 1934-35, exports constituted a record, and showed an increase of £2,484 over the previous year, 1933-34, and £203,908 over the year 1930-31.

The grand total exports of eggs in shell and in pulp in terms of eggs in shell is estimated to have been 3,000,000doz. for 1930-31, 5,200,000doz. for 1931-32, 7,300,000doz. for 1932-33, 7,900,000doz. for 1933-34, and 8,000,000doz. for 1934-35.

Compared with the previous year there was an increase export of 246,332doz. eggs in shell to overseas countries and of 38,150doz. to the other States. There were decreases of 121,000lbs. of egg pulp exported to overseas countries and 116,031lbs. to the other States. Practically the whole of the eggs in shell and in pulp to oversea countries is shipped to the United Kingdom, while New South Wales and Victoria are the heaviest buyers amongst the States of the Commonwealth.

The following are the details for 1934-35 and 1933-34:—

State.	Eggs in Shell.		Egg Pulp.		Total Value.
	Doz.	£	Lbs.	£	£
New South Wales (ex B.H.)	790,699	30,473	1,163,619	39,521	69,994
Broken Hill	287,943	12,805	16,938	497	13,302
Victoria	108,837	3,723	1,305,010	38,343	42,066
Western Australia	229,461	12,600	59,384	1,860	14,460
Other States	4,860	233	112,536	3,726	3,959
Total interstate 1934-35	1,421,800	59,834	2,657,487	83,947	143,781
1933-34	1,383,650	56,152	2,773,518	76,558	132,710
Overseas (direct) 1934-35	4,429,318	214,141	83,000	2,618	216,759
1933-34	4,182,986	219,721	204,000	5,625	225,346
Grand total 1934-35	5,851,118	273,975	2,740,487	86,565	360,540
1933-34	5,566,636	275,873	2,977,518	82,183	358,056
Increase	284,482	—1,898	—237,031	4,382	2,484

PAPERS READ AT CONFERENCES.

MURRAY LANDS WEST BRANCHES, ALAWOONA, 1st OCTOBER, 1935.

SILAGE AND SIDELINES.

[G. ANGUS THOMSON (Alawoona).]

Mallee farmers will be subject to considerable anxiety at frequent intervals because of the Mallee's contrary climatic conditions.

If Mallee farmers are to run more sheep, the conservation of fodder is necessary, so that the sheep may not suffer in long dry spells. When wheat and sheep fail, one strives to eke out a living from sidelines. Chaff or cocky-chaff and grain are not the best foodstuffs to make for better products from cows.

Silage is suggested as a conserved fodder (not that hay is not to be considered). There are two practical ways of making silage in these districts, either by stacking or by placing in a pit; 25 yards long, 6 yards wide and 6 feet deep. The ends are sloped to permit the driving of a light trolley right through it, thus consolidating the greenstuff as it is placed in the pit. It is filled several layers above the excavation, and then when it has subsided sufficiently, it is covered with earth to the depth of 2 or 3 feet. When the pit is being constructed the earth from the excavation is placed along the two sides of the pit, and is thus handy for covering when filled with a scoop. Cutting the crop green does not take so much out of the soil as the growing of matured wheats, or other cereals grown for hay.

Wheat grows the best of other cereals in the Mallee areas. Therefore, probably a Macaroni wheat would be the best to plant for silage, or perhaps Rye.

A Macaroni wheat is suggested because of its hardiness and virile growth. The purpose of making ensilage is to preserve as much as possible of the properties of greenfeed.

If the process is carried out by stacking, the stack must be well weighted, to compress the material and thus exclude air as much as possible. The Department of Agriculture can provide literature which deals with the technical details comprehensively. Silage will keep for a good many years, and should the Mallee experience at any time phenomenal years, it would be wise for settlers to lay up a store for the lean years that might come. Hay will not keep for long and its properties decline more readily than ensilage. Ensilage makes for more and better milk and butter. When there is no green picking to be had this naturally reacts favourably on pig production. It would pay if more attention were given to the poultry on many holdings. Quite a few people are able to boast of a few more coins in their pockets than the other fellows because they have given more care to their fowls. A Lucerne patch should be established by the homestead to augment the barnyard diet, and then eggs worth grading may be produced.

CHANGED ECONOMIC VALUE OF MALLEE LAND.

[T. BRUCE FLINT (Alawoona).]

At present and during the past few years, there has been much adverse criticism of the Mallee. Its economic value to the farmers, and to the State has been questioned and one must admit much of the criticism is justified.

The financial position of the farmer is nothing less than deplorable; the state of his plant is almost as bad. There are few portions of the earth which have not some economic value. The first essential is to discover the true economic value, and the second to discover if it is likely to be profitable to develop this.

Agriculturally speaking, rainfall is the principal factor as to the value of any land. In Australia there are thousands of square miles of country with a precipitation of under 6 inches. This country has, and still is producing great wealth, and where it has failed, much of the failure can be traced to faults such as overstocking.

If country of such low rainfall as this is producing wealth, surely the Mallee land—the worst of which has an annual precipitation of between 10 inches and 12 inches—can produce something more than the annual deficits of public and private funds, and the hopelessly despondent attitude so noticeable today among the wheatgrowers of the Mallee. The trouble can be traced not so much to the failure to find the true economic value of the Mallee, as to the failure to realise that the value now lies in a different direction. The mere fact that it has at least two values should prove it is not the valueless country so many people like to assert. Until 1916, the only economic value the Mallee had was wheat growing. The financial position of farmers generally and the improved state of the farms prove it was a true value up to that time. That is no longer the case, and the present difficulties are largely the fault of farmers, Banks and Boards to realise that the economic value has altered. Wheat growing, owing to low prices and high costs, is no longer profitable, and it remains for those who have to live in the Mallee to discover and exploit the changed conditions. Wheat growing should now take its proper position—that of a sideline—at least until such time as prices improve considerably.

At the moment sheep appear the only profitable way of working the Mallee—either wool or lambs, or both. Unfortunately, the limited size of the holdings prevents sufficient numbers being carried to provide a decent income without overstocking. The change-over cannot be successful unless farmers, Banks, and Governments all do their share. The farmer's share is to forget the past and realise that the Mallee must for some years, at any rate, be treated as a grazing proposition, and to plan his farming operations with the one aim of carrying as many sheep as is consistent with safety.

The Bank's work is to provide finance for the change-over. The Government's is for legislation to reduce rents to the level of grazing leases, and to increase the size of the holdings to those who are most likely to make a success of the change-over.

Fodder Conservation.

On the single farm, the aim must always be to conserve fodder and improve pastures. Conservation of fodder should comprise the maximum of hay, oats, and ensilage. If fallow is sown to oats, there should be no difficulty in a normal season of cutting one ton per acre of hay, and the material for ensilage can be obtained by beginning the cutting season somewhat earlier.

Most of my land is now sown to Wimmera Rye Grass, and it is proving a profitable investment. The Department of Agriculture advocates various other grazing plants, such as Lucerne, Evening Primrose, etc. The policy should be, to fallow well 300 acres, and sow to oats and perhaps barley and rye.

Keep fallowing with a plough where necessary and cultivator where possible. All that is necessary is to break up the ground. This will promote the growth of the Wimmera Rye Grass, provide fair feed during the winter, and leave the soil in a condition suitable for the sowing of oats to be used for grazing. If all land on the farm is treated in this way every 4 years, the maximum grazing will be obtained. This can be considerably improved by further subdivision and by growing Lucerne.

Suitable as is this method of work, the average holding is not large enough to provide a decent living by grazing. It is necessary to have about 3,000 acres, all of which will, in due conrse be sown with super and cereals for grazing. The difficulty of increasing the size of the holdings is realised, but for general principles it is better to have one prosperous farmer than three impecunious ones. It is a matter for the Government and the Banks to arrange, but in doing so it must be borne in mind that the transition from wheat growing to grazing must also include reduction in rent. Charges which were always high even for wheat growing, will be impossible under grazing conditions. The farmers have lost, and as soon as Banks and Governments are prepared to realise they also must lose something, conditions will improve. Most farmers realise that the reduced yields are not all due to the lack of rain. The fertility of the soil has been reduced by too much wheat growing and too little grazing.

If the methods indicated be carried on for the remaining period of low prices, the fertility of the soil will have been restored. Should wheat prices by then be more remunerative, the farmer can revert to the production of cereals. With the increased size of holdings, there should be no difficulty in the future of maintaining soil fertility, providing adequate dressings of super are applied both to the crops for grass and grazing.

EYRE'S PENINSULA (EASTERN), AT YEELANNA, 16th OCTOBER, 1935.

PREPARING BEESWAX FOR COMB FOUNDATIONS.

[R. Schultz, Koppio.]

Wax is sweated by the bees into tiny bits like scurf, then kneaded into combs or whatever is needed by the bees. It is said that the bees eat 20lbs. of honey to sweat 1lb. of wax. To prepare wax from the capping knife to the mill first keep it clean. Put the cappings into clean vessels. Keep all weather away from it, especially rain. When the honey season is over, melt up the wax, add a little water and melt in a vat of water. When the wax is melted dip off and strain into a receiver which will hold the lot which is melted. Cover up and allow to cool slowly. Cooling may take three days. It will then be ready for the mill, and it will be prime wax. If the wax is melted a number of times to get it clean, it loses its texture and is poor stuff for comb foundation. Dirty black wax can be cleaned with vinegar or sulphuric acid, but it is a poor product. A lot of wax is used in the Telegraph Department, and wax cleaned in this way is useless for this job as the acid interferes with electricity. Dark wax can be used in many ways; added to a little turps it makes a good floor polish. Wax, lamp black, and turps mixed properly make a splendid boot or harness polish. Many housewives use beeswax to polish their irons; they maintain that it keeps the iron clean and makes it work more smoothly.

CAN A PROFIT OVER EXPENDITURE BE OBTAINED IN GROWING FEED, ESPECIALLY FOR THE PRODUCTION OF WOOL WITH THE PRICE AT 1s. PER LB?

[J. Carter, Koppio.]

There are two aspects to this query, the storing of fodder for use during times of extreme scarcity, when it would be folly to let sheep seriously decline in condition, and the supplementing of natural pastures, even when quite good. It is to the latter aspect that my query is directed. Assuming, for the sake of demonstration, that a farm would carry ½ sheep to the acre on the area available for grazing reasonably well, on a fair average season, cutting, say 10lbs. of wool per head, what increase in production could be obtained by growing fodder crops, or by top-dressing the natural pasture for them?

"Keeping sheep reasonably well", I would define as keeping them only in such condition that no break appeared in the wool. The increase in production could be in either one of two ways—more wool on the same number of sheep, or approximately the same amount of wool per head on an increased number of sheep—the latter way, in my opinion, being the more practicable.

My experience has been that top-dressing the natural pastures with 90lbs. of super per acre, will increase the quantity of food by 50 per cent. from the first application as well as improving the quality of it. Assuming that the 50 per cent. increase in feed, produced a like increase in wool, and with judicious management (it is a reasonable inference that it would), there would be a loss incurred on the undertaking. With super at £4 10s. a ton on the farm, a 90lb. dressing would cost 3s. 9d. per acre, and a 50 per cent. increase in wool on the ½ sheep cutting 10lbs. would be worth 2s. 3d., thus showing a loss of 1s. 6d. per acre.

On better grazing land, however, the result would be considerably better. Where the untreated natural pasture will carry one sheep to the acre, the 50 per cent. increase due to top-dressing would show a profit of 9d. per acre, and to carry the comparison still further, two sheep to the acre country would sow a profit of 5s. 3d. per acre. Probably one sheep to the acre would represent the carrying capacity of the greater area worked by members of this branch, and for that reason, I am taking that as standard. To obtain a profit of 9d. per acre for the carting and spreading of the super, does not impress me as being a remunerative return for the money and labour expended. An alternative to the top-dressing would be to crop 75 acres, preferably in two or more paddocks, with oats, or barley or both which would cost just the same as top-dressing 250 acres of grass, made up as follows:—

Ploughing at 5s. per acre	£18 15s. 0d.
Combining at 2s. per acre	7 10s. 0d.
1 bushel seed at 1s. 9d.	6 11s. 3d.
90lbs. super	14 1s. 3d.
Total	£46 17s. 6d.

The crop could be grazed in rotation with the grass paddocks until about the middle of September, and then left to mature, and used in the autumn when the supply of food was least plentiful. The disadvantage of the cropping, as compared with the top-dressing, would be in the later start in coming into use, but this could be largely overcome by fallowing the required area, and thus being able to get the crop started with the first good rain.

Probably one working, a cultivation in the spring time, would be the only extra one required, and at 2s. per acre that would reduce the area cropped, for the same expenditure, to 70 acres.

Whether the benefit from the cropping alternative would equal that from the top-dressing is for your consideration, and probably a combination of the two would be more nearly ideal.

TREE CULTURE ON THE FARM.

[J. H. VIGAR, Mount Hope.]

With few exceptions, our country districts are lacking in ornamental trees. The word ornamental embraces all trees which are likely to grow in our country districts. Many of our best trees are palatable to stock and rabbits, protecting them with a good fence and netting is money and labour wisely spent. Farmers in the wheat belt should be more alive to the advantages of tree culture, as districts above the 20 inch rainfall average, are generally better off in the way of beautiful trees, natural to their locality, so the lack of tree culture there, is not so noticeable. In our lower rainfall districts, many of the farmers are too drastic in the destruction of timber such as the mallee and native pine. More forethought should be used, thus preventing drift, a menace which is causing ruin to a vast area of this State.

Our noble redgum will have pride of place in wheat belt districts. This tree, though not generally reckoned to be a native of many districts, will do reasonably well in many more localities than is generally supposed. You will have noticed that the red gum is to be found growing practically all over Australia, in what one may term favoured positions, such as along water courses, edges of swamps, or in some low-lying place, where water has lodged at some time. The reason why the redgum is growing in these seemingly favoured positions is that a certain temperature is required to germinate the seed, and the young trees have started to grow from seed at the water's edge, in October, and have become established in favoured positions. It will do well in many more localities, other than its natural haunt. Where the redgum does not find conditions favourable, the sugar gum will often do fairly well. It is a native of this State, and I believe the Southern Flinders Range is its natural haunt. Some very fine specimens are to be seen in the Melrose district. The sugar gum is a very popular tree, and I venture to say it has taken pride of place in tree culture by the farming community, but it should not be planted in districts where the redgum would do as well. The Tuart gum of Western Australia is doing much to beautify many districts where no other variety of gum tree will thrive, such as our exposed coastal districts of a limestone nature and low rainfall. Livestock and rabbits are very fond of it, so it must be protected. The native pine should receive more attention, and will do well all through the wheat belt, and outside of "Goyder's line." Although young trees of this variety are not supplied by the Woods and Forests Department they are often easily raised from seed, where the parent tree is protected. As a rule they transplant successfully, if moved when young. Huge areas of this valuable timber tree have been destroyed in this State, and nothing is being done to replace it. The native pine will grow where the imported pine will die; therefore many of our districts with a low rainfall should be beautified by its culture. Most of the imported pines appear to do better in the higher rainfall districts, but the Norfolk Island pine is a good tree for many localities where the others will not thrive, and will do well in exposed coastal situations of a limestone nature. The sheoak is a tree which is quickly dying out, and more should be done to fence off certain areas to preserve it. The tree comes naturally from seed if protected, is a valuable fodder, and the continuance of its growth should be practised. Although not generally reckoned among the ornamental trees, the almond should be always given attention when tree planting is in progress. I have yet to find

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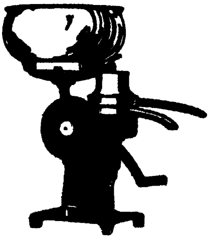

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the district in the wheat belt where this tree is not growing. All over the State it bears evidence of early settlement, it is a beautiful tree, and revenue-bearing. Therefore it should never be neglected. The Carob tree, although not much noticed, is a hardy tree, and some good specimens are to be seen in the northern areas, and also on the West Coast. There are many other imported trees which are hardy and will thrive in varied localities. The wild peach is a very valuable fruit tree, and will thrive in all districts under the 18in. rainfall. Just where my own homestead is situated, fruit trees will not grow successfully, other than the fig tree, and grape vines, the latter being in sheltered positions, but I have some very fine specimens of the wild peach growing from seed in a plantation of sheoaks, native pine, and Tuart gums. Much improvement of the fruit could be attained by selection, and I would like to see our fruit experts give attention to this tree with that object in view. The average person does not see much sense in doing work if he is not likely to receive monetary advantage. In all districts there are odd people who take a pleasure in beautifying their homesteads by planting trees. I want to see many others moved with the same incentive, and not to confine operations to the homesteads, but to extend to the paddocks and public roads. In conclusion, let us take warning of the drift menace in our own State and other parts of the world. The United States of America is having a bitter experience of thoughtlessness, and a high tree planting drive is in progress. Natural conditions had been destroyed, and nothing was done to replace them by better conditions. Let us take warning.

(Mr. Vigar suggested that, as a Centenary gesture, a meeting of each Bureau in every year be set aside for a discussion on tree culture. A resolution to that effect was passed at the recent Congress.)

THE PROBLEM OF SOIL EROSION.

[A. DOLEY (Yeelanna)]

This subject has been given considerable publicity, but it is of such importance that further discussion should be of value. Not only in this country is soil erosion being experienced but it is assuming alarming dimensions in Africa and the United States. In the United States, it is reported that 25,000,000 acres have become useless, and in Africa that the Sahara Desert has advanced 150 miles on a 700 mile front during only three centuries. Destruction of the natural timbers and herbage leads to erosion, whether it is in an area of high rainfall or low. In a high rainfall area, generally associated with hilly or mountainous country, the soil is often washed away, especially if cultivation is carried on extensively. When pasture takes the place of trees, the damage is not so great. But it is in the dry areas that the greatest menace lies in this State. The north east corner of the State can, judging by reports, be classed as desert with shifting sandhills, very little bush, and owing to continuous dry years, little or no grass. There being nothing to bind the soil together, in every wind the soil is being shifted, leaving the ground bare of topsoil and piling up the sand around any obstruction. Even if good rains come a lot of wind-swept ground would grow no feed, as there is no top soil to grow it on or to conserve the moisture. This desert tends to become larger, with every wind storm blowing the sand further onward covering fertile ground and destroying vegetation. The problem of staying the course of the sand in these areas has become a national one, and could probably best be done by re-afforestation on a large scale in the fringe country which has not yet been so spoilt by sand that it will not grow anything, even if a few good years were experienced. The prevention of further destruction of trees and bush in this fringe country rests with the individual at present, though just recently a deputation was received at Parliament seeking assistance in this regard. Assistance would also be necessary in keeping the rabbit pest down. Farmers in the drier portions of the State are up against the same problem, though on a smaller scale. Clearing the mallee has led to continuous cropping to kill the shoots. These methods have been carried on past the pioneering stage, and have made the soils more sterile and liable to shift. By keeping the ground covered with grasses, fodder crops, and leaving the stubble, and restricting the amount sown to wheat with its bare fallow period the trouble could be greatly lessened. By this means more stock could be carried and the soil would be improved; this in itself would lessen the tendency to drift. Belts of timber left or planted near the portions likely to drift will greatly assist in keeping them stable and also serve a useful purpose as shelter for stock, beside relieving the barrenness of the landscape. The question may be summed up as a plea for the tree; where clearing must be done let it be done wisely with a view to the future.

PREPARING LAND FOR SEEDING.

[R. PROCTOR, Yeelanna.]

I will commence my paper with the treatment of stubble land for growing oats and barley. If the stubble is on the light side, burn it early in the burning season, because once a rain falls the straw is spoilt for burning and stock also ruin light straw if allowed to run in it too long. If the stubble is fairly dense it is not necessary to burn until the end of February or the beginning of March; then it pays to burn and have the land free from straw so that if a good rain falls the land is ready for working. Immediately the straw has been burnt, harrow the land whether the conditions are wet or dry, so that the ashes are preserved instead of being allowed to blow away. By harrowing the stubble land early, the weeds are given a good chance to come up with the early rains, then the land should be cultivated with a stump jump cultivator, or if the land is of a loose nature, it can be done quite successfully with a spring tooth implement. After this working the land is ready for sowing oats, but for barley I think it pays to work it over again during the month of June with a spring tooth implement, and if the land is free from weeds the barley can be sown with a combine with harrows attached.

In regard to the working of fallow land a great deal depends on the weather conditions. If rain falls in February or beginning of March, I like to harrow with a good heavy set of harrows, working in the opposite direction to the previous cultivation, so that all ridges are levelled off; then the cultipacker should be brought into use. A light built packer will be found a great advantage with bags of sand on the packer to give greater pressure on the under layers of soil, but if the land is of a sandy nature it is impossible to work a packer with heavy weight on, as it has a tendency to push the sand ahead. I am a great believer in the use of a packer, especially in heavy soils that have a loose nature. This implements breaks down all the clods and firms the seedbed considerably. By having the fallow well packed, all weeds germinate much more rapidly than on fallow that is left in its rough state, and a good germination of weeds with the early rains is one of the main reasons for a good healthy, clean crop of wheat, because weeds started in April are much more easily destroyed while the day temperatures are fairly high than they are in the early winter months. Not only does the packer give a good germination of weeds, but it also gives a far better germination of wheat when sown. If the fallow is carrying a lot of big clods when seeding time arrives, a patchy germination is often the result, particularly if the opening rains are on the light side. Therefore the cultipacker is an implement that is due for much greater credit than it receives, and no farmer should be without this implement. After the land has been packed and further rain falls, the land should be harrowed again or a light working with a spring tooth cultivator or combine given; this working to cut all the small weeds. It is very important to have all the tines of the cultivator set as near as possible to the same depth, and never use a spring tooth with some tines with new shares on and some with shares half worn out. Have all new shares or all partly worn, because uneven shares always leave an uneven seedbed.

Grassland has proved quite a success in this district for growing wheat or barley and is perhaps the most efficient way of producing these two cereals. When preparing this land, I always like to get a good grass fire over the paddock, or if a fire is impossible, the land should be stocked very heavily so that any grass is cleared away as much as possible. When the first rain falls after harvest get some of the ploughing done; time for this work can be found while waiting for weeds to get a start on the fallow On land that has had a good grass fire over it I prefer the mouldboard plough for this work which should be done as shallow as possible, but the plough must be set for narrow cutting, so that a thorough job can be done. If, on the other hand, the land is carrying quite a coat of dry grass, I prefer the cultivator for breaking up grassland, as this implement leaves the rubbish on top of the soil instead of turning it under as a plough always does. My reason for leaving the grass on the surface is because the land packs down a lot better. When a lot of grass is turned under it has a tendency to keep the soil too open and the results are often a badly affected crop with take-all. When a cultivator is used for this purpose it must be equipped with a set of narrow shares, otherwise great difficulty will be experienced in keeping the furrows down. After the land has been broken up, I usually harrow with heavy harrows, working across the ploughing as much as possible; then in the case of another rain the land should again be cultivated with a stump jump cultivator, this time using a wider share. Immediately after this cultivation the land should be packed down so that any weeds, such as charlock, poppies, or clover that have not already germinated, will be given a better chance to start before the crop is sown. After the packing has been completed it may be an advantage to harrow again, or if the weeds are still making an appearance, a working over with a spring tooth implement will be found quite a payable proposition. After these workings, the land is, or should be, in good condition for seeding. You will see that this land receives a good deal of working, but it is still far below the cost of fallow prepared land, besides an extra year's feed can be obtained from this land, which will more than compensate for the difference in yield between grassland and fallow. Some people just plough up grass land, then combine it in, but I maintain that a few extra workings make the difference between a good and poor crop. No doubt some people will think that my preparations of land for seeding seem almost impossible, but all this work can be accomplished if a good, strong plant is on hand and plenty of power used for hauling the implements. I find that 400 acres farmed in the manner that I have tried to explain are much better than 600 acres farmed poorly.

EYRE'S PENINSULA (EASTERN). at BUTLER, 8th OCTOBER, 1935.

FAT LAMBS ON EYRE'S PENINSULA.

[E. J. BARRAUD, Lipson.]

The fat lamb industry is rapidly becoming of great importance in this part of the State. Those people who placed their money in the Port Lincoln Freezing Works and thought they had lost it are now realising that it is one of their best investments. Building palatial offices in the city is not evidence of prosperity, for a primary producing country's real wealth is in the volume and value of its exports. Lamb raising for the overseas market is one of our principal sources of wealth, and for that reason we should enter the business on sound lines. The past two or three years have been fairly good grazing seasons, except for the grasshopper plague. However, seasons will not always be favourable, and the fact that so little provision is being made to conserve fodder is causing some concern to those who are looking forward to great expansion in this industry. Many farmers on Eyre's Peninsula have had very little experience with sheep and lambs, as they are just changing from wheat growing to mixed farming, and a word in season may not be out of place.

Sowing catch crops for ewes and lambs is quite the right thing, but it is not sufficient. In a very late season, or a very dry one, sown crops make little, if any, growth. Besides providing green feed, provision should be made for hand-feeding when necessary. Climate and conditions vary on the Peninsula, and methods to be adopted for hand-feeding may be different. The writer's experience, however, leads to the opinion that lamb raisers of, say, 200 or 300 fat lambs should have at least 50 tons of hay and 500 or 600 bushels of oats in reserve for their sheep. There will be seasons when it will not be needed, but that should not cause any worry; it will be there when required.

Hand Feeding.—The plan should be to cut wheaten hay when in bloom, before the grain forms, and get it into the stack as soon as sufficiently dry. The hay, being green and without grain, will not be troubled by mice. In feeding the sheep, the hay should be chaffed and mixed with oats. Ewes with lambs should maintain their condition on 1½lbs. of chaff and 1lb. of oats daily if the sheep have the run of a stubble paddock. It is not advisable to feed grain to ewes before lambing, unless in low condition, because there is a risk of their becoming too fat. Self-feeders are not favoured because they allow the strong sheep, which need feed least, to get the most. A good plan is to feed in boxes; quite a small box will feed 4 sheep. A good feeder can be made by putting two posts in the ground at each end of a bag trough. About 12in. apart, drive stakes into the ground every 4 or 5ft., the same distance apart as the end posts, and bore holes in the posts and stakes about 14in. above the ground. Strain a wire on each side, open cornsacks the long way, and stitch the bag to the wire, leaving a bag trough between the stakes. It is necessary to put a weight in the trough to prevent the wind destroying the bagging. Water pipes are best for the purpose. Boxes, however, are easily moved, and will last for years, if taken care of.

Foxes.—If foxes are troublesome, and ewes and lambs are not yarded, it is well to feed just before nightfall. Ewes will camp with their lambs the greater part of the night after a feed. Foxes get the lambs when the mothers leave them some distance in search of food. If you yard the sheep, make a fairly large enclosure in a sheltered spot; one height of netting is sufficient. Foxes are very timid, and will not venture into a yard when sheep are there.

Suitable Rams.—If Eyre's Peninsula is to become a big lamb export centre, more crossbred lambs should be produced. A difficulty facing farmers, especially in the newer districts, is the ram. Too few are usually mated with the ewes, and in consequence the lambs are dropped over too long a period. A ram should be used for every 40 ewes in the flock. What is to be done with the rams after the mating season is the problem. The best solution seems to be for at least one farmer in each district to have a stud of one British breed, and hire rams to his neighbours. Opinions differ as to the best cross for the market, but in considering this question the district has to be taken into account. The short wool breeds do remarkably well in the warmer and drier districts, while the longwools appear to be best in colder and poorer localities. The exporter is looking for the short-legged, fine-boned, thick-bodied lamb, with bloom and sap, and will pay to get what he wants.

A very bad season with very little reserve fodder for the flocks would give this growing enterprise a set-back that might be felt for years. If you must gamble, do it on the sale of your produce, but do not gamble on the seasons.

FODDER CONSERVATION ON THE FARM.

[C. F. Jericho, Butler.]

For the past four to five years Eyre's Peninsula has been very fortunate in early rains for feed, and the increase in the stock-carrying capacity of the land has been wonderful. Settlers, however, are facing a great danger, that of overstocking. On most farms it is surprising to note how little hay or other feed is set aside to carry the stock over a late or poor season. It should be the aim of every farmer who manages his holding as a mixed farming proposition to make adequate provision for future years. It is difficult, of course, to know in just what form to conserve fodder. If much hay is cut, mice are the chief trouble, and in a few years the stack will be destroyed. Much could be done by storing oats in silos made of galvanised iron; 5ft. 8in. sheets could form the circular part of the silo and if made 5 or 6 sheets high it would store 350 to 400 bags of loose oats. Mice could not damage the grain, and if put in dry and clean, it would keep for many years.

In good years a lot of growth on the farm could be conserved into ensilage. Providing it is done in the right way, this fodder will keep for years without any damage by vermin and it is necessary if Eyre's Peninsula farmers are to make a proper success of fat lambs. For feeding sheep through a dry spell hay seems to be the best. Cut Early Burt oats for hay on the green side, and if carted into the paddock there will be hardly any waste. Farmers are warned not to overstock, and to make proper provision to tide the stock over bad seasons and those years when the opening rains are late.

SOME SUGGESTIONS FOR THE EYRE'S PENINSULA FARMER.

[Frank Masters, Verran.]

Under conditions pertaining to developing a scrub farm one is forced to continue growing wheat, at least to a certain extent, for several reasons, the greatest being the need of preserving stock, plant, and machinery that cannot be very well scrapped. Then too, wheat dovetails in with livestock husbandry for feeding purposes. Also, unless the land is cropped with some cereal, shoots will again take possession and the whole previous labour is wasted. Wheat generally seems to fill the bill. Even when the shoots have been all killed, the land goes back until the grazing becomes very scanty unless cropped and manured. The aim should be to grow the heaviest crops possible. Early fallow, worked and kept clean with sheep and sown to suitable varieties of wheat for the district and of good milling quality should give best results. It is necessary to test different varieties from time to time from breeders of repute. Wheat selections are being made at Roseworthy College with a view to increasing the yielding qualities of good flour wheats, in order that demand for our wheat overseas is maintained and if possible stimulated. Such wheats as Gallipoli, Nabawa and Waratah must be discarded to achieve this end. When one comes to consider the average for County Jervois for the past four seasons, (only 7.66bush. per acre) it is evident that general farming methods need review in an endeavour to increase our returns. Taking similar type country and rainfall on the other side of the Gulf, in County Daly, we find an average for the same period of 14.91bush. per acre, and until we approximate that average here we should not rest content. Their average is obtained by intensive farming, ours by extensive, and it would pay us better to limit the area and give it greater care and attention. This would mean cropping with wheat infrequently, and growing fodder crops for grazing and rotational cropping with oats and barley. Thus the farm would become a mixed farming proposition with improved results financially. This is possible throughout this country now that water reticulation is fairly general. Sheep for wool and fat lamb raising, cows of good dairy strain, pigs of right type, and poultry raising should be our aim. Expenditure on fencing is of course necessary, and the greater the number of paddocks on the farm, the better the rotational grazing of both natural pasture and sown. Once the fencing has been done the aim should be to carry the largest number of stock consistent with carrying them well, thus getting the most from the fencing. The number of stock a farm can carry is usually governed by what it is possible to carry through the dry and lean period of the year. Here is one of our weak points, but it can be remedied by the growing of oats, barley, rye, lucerne, and Wimmera grass and the making of some of them into hay and silage, and hand-feeding as required and grazing the rest. Thus the number could be increased probably 50 per cent. or even more, and the revenue likewise. Certainly a little more labour would be necessary, but that item is to-day reasonable and would assist the unemployed problem. Quantity is not the only consideration, but attention must be paid to the quality of the stock, remembering that second-rate stock eat as much as the best, and the better the quality the better the returns. I would suggest buying the best the pocket will permit and improving it as the opportunity occurs. Taking Merino sheep for instance, it is wiser to buy from stations where breeding for wool (and frame to get more wool) is a specialty, than to attempt breeding for oneself, especially in view of the fact that fat lambs are worth more than grown sheep off shears. The wool will be all right, of even type, the frame all right for breeding fat lambs, and two fat lambs will be raised in the time it takes to raise a sheep. Also the lamb is grown during the winter months, when feed is usually abundant, and goes off the mother before the feed becomes dry and scarce. This in itself means more ewes can be carried, especially if care has been taken to put by stocks of fodder to ensure their welfare until the green feed comes again. The early lamb is the more profitable and Roseworthy experiments have shown that should green fodder be absent in March, April and May, early lambs can be grown satisfactorily on silage and some grain such as oats or barley. As to rams, whilst most British breeds are suitable, I prefer the Border Leicester, as should anything untoward happen and lambs be left on hand, that setback would be nullified by having the ewe lambs next year as ideal crossbred mothers, and the foundation laid for the highest type of lamb if they are then mated to Southdown rams.

The crossbred ewe would also have a fairly valuable fleece, which is not the case with most of the British breeds except the English and Border Leicester, and Ryeland breeds. Likewise, with cattle, the best should be kept. Decide upon the breed and buy the best possible. Weigh all milk night and morning and test the cows for butterfat, say, every three months. I have discovered, by this means, that even from the same parents differing strains in regard to production are discovered, thus giving one the opportunity to discard the lower and breed from the higher and build up the production of the herd. It pays to feed for production when cows respond, otherwise the food is wasted.

Pigs should have their place in the farm economy, thus converting waste offal, milk, etc., into a marketable commodity. Indeed, much of our wheat could profitably be fed to these animals, as 4lbs. of wheat are calculated to produce 1lb. pork; the former at say, 2d. and pork at 4d. show what might be done, and is being done at the present time by many who devote the necessary attention to pig raising. Green feed paddocks with self-feeders give the best results, and failing green feed meat-meal would assist in giving the diet the necessary balance. Poultry needs are in egg-production powers, and the foundation stock should be of good laying strain of whatever breed is chosen. White leghorns seem to fill this bill nearest, although some strains are better than others.

To-day the farmer has more definite selection at his disposal through breeders' societies of sheep and pigs, herd testing by the Agricultural Department, and egg-laying competitions at Parafield and elsewhere under strict supervision, so that there can be little excuse for not increasing the productive value of all livestock by judicious selection. Also, crop competitions indicate values of different varieties of wheats.

These are various directions in which increased returns can be expected. In the management of rotational grazing of paddocks the health and constitution of the stock can be improved. All pasture should be handled to keep it short. The sowing of cereals early with the first rains to ensure sufficient feed must be undertaken. Rye in this connection can be highly recommended as giving twice the amount of feed of any other cereal in the same time. It needs grazing heavily to get the best from it, as it is notably hard in straw, when it becomes stalky. Barley is highly palatable in the green stage, and, as grain, should give higher returns than wheat. Oats for grazing and hay have their place, especially the earlier varieties, which mature sufficiently early to allow them to be got out of the way or into stack before the wheat is ripe.

[*Papers Read at Conferences.*]

THE ADVANTAGES OF CROP COMPETITIONS.

[N. G. STEWART, Butler.]

As South Australia is solely dependent on production and the growing of grain as the main source of revenue, the time has arisen when the members of the Agricultural Bureau must look for some method of improving the yield and producing a quality of grain high in commercial value. By district Crop Competitions and co operation of producers, much benefit could be attained. To win a Competition the farmer has to produce a crop that at the time of judging by an officer of the Department of Agriculture has the promise of a good yield, is true to type, free from weeds and foreign matter, and diseases that are under his control, such as take all, smut, bunt, &c. For this purpose the opportunity is now available to obtain seed true to type from the Roseworthy College, or from the Experimental Farms and plots conducted under the supervision of the Department, and by careful rotational cropping and suitable methods each producer can compete.

Critics tell us that it is not a paying proposition to work and prepare for seeding the whole of the land cropped in the same manner as the Competition plot. In my opinion, results speak for themselves, for in the majority of districts where plots are conducted the yield from these plots is much higher than the district average and should be an incentive to work and seed only the acreage that could be done thoroughly, and not try and prepare more than what the plant can manage in proper seasonable time.

Through such channels as the Competitions we would build up a better standard of commercial grain, as in many instances varieties of low milling quality are disallowed for competition; and wheat from Competitions is always keenly sought after for seed for the following crop.. They also strengthen the membership of the local Branches of the Bureau as they create social interest in the district, because each competitor follows the progress of other entries and methods, and in most cases a District Inspection is organised, when each entry is inspected and its methods of cultivation, varieties used, and the estimated yield fully discussed. From all these point much practical knowledge is obtained.

NON-IRRIGATED FRUIT GROWERS' CONFERENCE, LYNDOCH, 5th NOVEMBER.

FERTILISING ORCHARDS AND VINEYARDS.

[B. BOEHM, Light's Pass.]

The practice of manuring has not kept abreast of the other branches of horticulture, such as spraying, pruning, &c. In the fifteenth century the value of marl, chalk, ashes, soot, blood, and decayed corn, &c., were recognised as a manure, yet to-day it cannot be said that the application of a certain quantity of a certain kind of fertiliser will give a certain increase of fruit. The wheat grower knows for certain that if he applies a quantity of superphosphate he will receive a certain increase in yield. Likewise, the pastoralist knows that if he topdresses his land he will be able to grow heavier and better pastures.

In fruit and vine growing, however, one can only point to isolated instances where the application of manures has proved of benefit. The Berri Orchard has proved that under irrigation an application of 5cwts. of sulphate of ammonia to citrus trees has been very profitable. Under irrigation practices manuring is much more general than in non-irrigated land. In some instances up to a half a ton of fertiliser is applied per acre.

Mr. H. N. Wicks, in a paper, "The Problem of the Off Year in Apple Cultivation," has proved that an application of sulphate of ammonia has been of benefit to apple trees. On the other hand, an experiment conducted on Messrs. Plush's property at Light's Pass, an application of superphosphate actually decreased the yield of apricots, yet applied in conjunction with sulphate of ammonia resulted in an increase of about ½bush. per tree.

Another experiment in the Barossa district, it is hoped, will prove of benefit to apricot growers. In this soil, sulphate of ammonia and complete manure, as against no manure, are being replicated three times. The test is now in its second year. The result of the first year is very encouraging as regards the last harvest, and also the condition of the trees for this harvest.

Then there is the experience of growers as a whole. Some have not worried about the subject at all, being content to take from the ground as much as it will give, and in return put nothing back, which is a poor policy. Again, others are very enthusiastic about potash, superphosphate, nitrogen, cover crops, &c., but as a result of all this the grower cannot point to anything definite of what to apply, how much, where, or when. To overcome these problems it is hoped that the Department will at some time take the matter up. In the meantime, however, every grower should start to make some simple comparisons himself, such as, say:—

(1) Complete manure against no manure.
(2) Sulphate manure *versus* no manure.
(3) Green manure against bare ground.
(4) Stable manure against no manure.

The average grower could do this by dividing a fairly uniform block of trees or vines growing on apparently the same class of soil, treating half the block with the proposed manure and leaving the other half alone. The grower will soon get interested in his experiment, and after some years—by noting the harvest and the condition of his trees and vines—he should be able to determine a plan of manuring suitable to his particular locality and conditions.

In this proposed comparison phosphoric acid has been omitted because, although it is essential to the cereal grower, it seems fairly safe to say that super applied as a tree or vine food is a failure. There is, however, another use for it; top dress a portion of the garden with, say, 2cwts. of super per acre in early autumn with the object of making the natural grasses grow; these can be ploughed under to increase humus. Sulphate of ammonia could also be tried in a like manner.

GREEN MANURES.

It will possibly be contended that the practice is too risky, and it is admitted that in some years without irrigation it will not be possible to plant the seed early enough, but where the rainfall is 20in. or over, or where irrigation can be applied—even if only on a small scale—the risk of using too much moisture is well worth while, because there are certainly very few, if any, fruitgrowing areas where a supply of humus is not essential.

Superphosphate comes into its own here, too, when the seed is sown a dressing of, say, 2cwts. or 3cwts. per acre will give the crop a good "kick off." The crop must be sown early to obtain the maximum bulk some time before bud burst. The crop should be turned under two or three weeks before bud burst. Late turning under at tree blossoming or after should be accompanied by an application of 1cwt. or 2cwts. of sulphate of ammonia in order to prevent the locking up of available nitrogen by soil bacteria and consequent short supply for the trees, which it is estimated take in about 90 per cent. of their plant food at or prior to bud burst. Lime is also important. In land that has been under cultivation for years the finer particles of lime have probably been baked into the subsoil in heavy ground. Lime also is necessary to improve the texture. Green manuring also tends to bring more acid into the ground, and lime will again be necessary.

There are about a dozen elements essential to plant life, but of these it appears that only four need concern the grower; these are nitrogen, phosphate, potash, and lime. By applying any one of the latter another may automatically become deficient. For instance, there may be a shortage of nitrogen, but as a result of the increased growth due to added nitrogen, there may be insufficient phosphate to maintain this extra growth, and so a phosphate deficiency results. Likewise, if phosphate and nitrogen are applied, these may expose a scarcity of potash.

DEPARTMENT OF AGRICULTURE.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

LEADING SCORES TO WEEK ENDED 22nd DECEMBER, 1935.

FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—White Leghorns.

	Eggs Laid.	Bird Nos.
Singles—		
E. McKee	188	27
H. C. Stacy	181	36
E. McKee	177	28
J. J. Devlin	177	207
Trios—		
E. McKee	519	28–30
B C. Sanders	478	157–159
V. E. Williams	477	313 315
Teams—		
J. J. Devlin	890	205–210
C. R. Wharton	890	127–132
S. Hill	853	85–90

Class No 2 —Any other Light Breed.

Singles—		
A. Heaysman (Cuckoo Leghorn)	175	323
A. Heaysman (Cuckoo Leghorn)	138	322
Langmaid and Bettison (Black Minorca)	138	321

Class No. 3.—Black Orpingtons.

Singles—		
K. Pennack	168	340
H. J. Mills	157	335
A. G. Dawes	148	327
Trios—		
H. J. Mills	427	331–333
A. P. Urlwin	346	465–467
L. S. Ekers	340	358- 360
Teams—		
H. J. Mills (only 5 birds)	710	331–336
K. Pennack	646	337- 342
H. H. Gallagher	608	343 348

Class No. 4.—Any other Heavy Breed.

Singles—		
H J. Mills (Rhode Island Red)	182	364
F. F. Welford (Rhode Island Red)	144	374
V. F. Gameau (Rhode Island Red)	142	380
Trios—		
K. Pennack (Barnevelders)	398	388–390
V. F. Gameau (Rhode Island Reds)	342	379-381
K. Pennack (Barnevelders)	340	385–387
Teams—		
K. Pennack (Barnevelders)	738	385–390
A. G. Dawes (Rhode Island Reds)	596	367–372
V. F. Gameau (Rhode Island Reds)	556	379–384

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Singles—		
G. R. Cowell	149	391
A. J. Monkhouse	145	398
A. J. Monkhouse	141	402
Trios—		
A. J. Monkhouse	357	400–402
A. J. Monkhouse	324	397–399
Teams—		
A. J. Monkhouse	681	397–402
G. R. Cowell (only 5 birds)	514	403–408

Class No. 7.—Black Orpingtons.		
Singles—		
W. R. Christie	111	409
Class No. 8.—Any other Heavy Breed.		
W. R. Christie (Rhode Island Red)	127	412
SECTION 3.—WET MASH.		
Singles—		
Eric Pratt, Abattoirs (White Leghorn)	176	434
Warren Hannaford, Paracombe (White Leghorn)	168	422
Peter Western, Ascot Park (White Leghorn)	164	415
Herbert Oliver, McLaren Vale (Black Orpington)	156	442
Peter Western, Ascot Park (White Leghorn)	154	416
Gordon Gallasch, Gilles Plains (White Leghorn)	154	437

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR Summer, 1936.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

BLACK ORPINGTONS.

EGGS.—10/- per Setting of 15 Eggs. Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—17/6 per dozen; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30/- per 100.
DAY OLD CHICKENS.—15s. per dozen; £3/10/- in lots of 100.

Free on Rail, Salisbury.

DELIVERY.—CHICKS—January to March.
EGGS—January to February.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
B Cooke, Kanmantoo	1	93	
	2	114	
	3	144	351
	4	139	
	5	169	
	6	154	462
			813
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	149	
	14	—	
	15	155	304
	16	172	
	17	133	
	18	85	390
			694
H. F Muirson, Yundi	19	dead	
	20	124	
	21	75	199
	22	119	
	23	163	
	24	58	340
			539
E McKee, 5, Rose Street, Carrondown.	25	139	
	26	dead	
	27	188	327
	28	177	
	29	171	
	30	171	519
			846
H. C. Stacy, Meadows	31	87	
	32	106	
	33	162	355
	34	68	
	35	137	
	36	181	386
			741
T Cleaver, Bridgewater.	37	76	
	38	117	
	39	92	285
	40	150	
	41	114	
	42	132	396
			681
U Sandstrom, Yundi	43	136	
	44	dead	
	45	dead	136
	46	71	
	47	85	
	48	131	287
			423

Competitor.	Bird No	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
A J. Monkhouse, Woodside.	49	78	
	50	152	
	51	152	382
	52	172	
	53	103	
	54	149	424
			806
J. F. Smith, Meadows.	55	136	
	56	105	
	57	7	248
	58	119	
	59	33	
	60	142	294
			542
A. Young, Bridgewater	61	157	
	62	145	
	63	136	438
	64	103	
	65	165	
	66	135	403
			841
R. W McAllister, Yundi	67	72	
	68	125	
	69	130	327
	70	115	
	71	67	
	72	141	323
			650
T Duhring, Mallala	73	167	
	74	dead	
	75	120	287
	76	65	
	77	72	
	78	94	231
			518
R. J. Underdown, Meadows	79	49	
	80	105	
	81	167	321
	82	117	
	83	90	
	84	155	362
			683
S Hill, Bridgewater.	85	120	
	86	161	
	87	122	403
	88	155	
	89	158	
	90	137	450
			853
W R. Hedger, Yundi.	91	84	
	92	122	
	93	134	340
	94	121	
	95	107	
	96	131	359
			699

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals 22nd Dec., 1935.	
Langmaid & Bettison, Salisbury.	97	112	
	98	54	
	99	92	258
	100	146	
	101	66	
	102	3	215
			473
E. Portlock, Meadows.	103	166	
	104	141	
	105	147	454
	106	122	
	107	103	
	108	136	361
			815
Murray Powell, Jupiter Creek.	109	167	
	110	47	
	111	150	364
	112	128	
	113	165	
	114	37	330
			694
G. W. Bignell, Meadows	115	152	
	116	119	
	117	122	393
	118	85	
	119	148	
	120	148	381
			774
W. M. Field, Yundi.	121	140	
	122	30	
	123	118	288
	124	88	
	125	66	
	126	147	301
			589
C. R. Wharton, Meadows.	127	143	
	128	152	
	129	166	461
	130	159	
	131	144	
	132	126	429
			890
H. H. Hefford, Murray Bridge.	133	129	
	134	151	
	135	144	424
	136	61	
	137	146	
	138	100	307
			731
F. W. Gage, Meadows.	139	127	
	140	4	
	141	dead	131
	142	134	
	143	119	
	144	91	344
			475
W. H. L. Norman, Echunga.	145	77	
	146	64	
	147	—	141
	148	171	
	149	127	
	150	74	372
			513

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
B. R. Whittington, Yundi.	151	120	
	152	90	
	153	127	337
	154	150	
	155	125	
	156	121	396
			733
B. C. Sanders, Meadows.	157	154	
	158	157	
	159	167	478
	160	147	
	161	89	
	162	dead	236
			714
H. H. Gallagher, Pooraka.	163	76	
	164	dead	
	165	140	216
	166	111	
	167	77	
	168	154	342
			558
W. Sickert, Meadows.	169	168	
	170	105	
	171	165	438
	172	115	
	173	129	
	174	156	400
			838
W. Restall, Echunga.	175	96	
	176	—	
	177	110	206
	178	145	
	179	128	
	180	113	386
			592
A. G. Dawes, 230, Portrush Road, Glenunga.	181	159	
	182	126	
	183	131	416
	184	102	
	185	92	
	186	159	353
			769
G. W. Sykes, Yundi.	187	139	
	188	95	
	189	82	316
	190	116	
	191	112	
	192	151	379
			695
R. Bartley, Meadows.	193	90	
	194	171	
	195	138	399
	196	102	
	197	135	
	198	149	386
			785
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	85	
	200	128	
	201	81	294
	202	130	
	203	93	
	204	87	310
			604

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
J. J. Devlin, Meadows.	205	134	
	206	141	
	207	177	452
	208	145	
	209	120	
	210	173	438
			890
D. J. Foxwell, Echunga.	211	113	
	212	125	
	213	45	283
	214	17	
	215	141	
	216	63	221
			504
F. J. Buck, Meadows.	217	133	
	218	146	
	219	166	445
	220	88	
	221	116	
	222	100	304
			749
J. A. Grist, Yundi.	223	45	
	224	90	
	225	120	255
	226	52	
	227	—	
	228	122	174
			429
L. A. King, Meadows.	229	152	
	230	146	
	231	dead	298
	232	53	
	233	dead	
	234	dead	53
			351
R. W. Sando, Echunga.	235	105	
	236	71	
	237	85	261
	238	111	
	239	99	
	240	101	311
			572
R. W. Young, Meadows.	241	162	
	242	122	
	243	136	420
	244	137	
	245	—	
	246	77	214
			634
A. Jarvis, Yundi.	247	136	
	248	73	
	249	116	325
	250	145	
	251	112	
	252	175	432
			757
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
S. Bridge, Yundi.	259	145	
	260	159	
	261	132	436
	262	87	
	263	133	
	264	118	338
			774
H. G. Egarr, Meadows.	265	118	
	266	83	
	267	dead	201
	268	20	
	269	111	
	270	41	172
			373
R. H. Smith, Yundi.	271	147	
	272	119	
	273	145	411
	274	160	
	275	42	
	276	148	350
			761
J. M. Lawson, Meadows.	277	156	
	278	159	
	279	112	427
	280	93	
	281	138	
	282	66	297
			724
J. O. Marshall, Yundi.	283	22	
	284	140	
	285	149	311
	286	136	
	287	148	
	288	82	366
			677
G. Joyce, Meadows.	289	14	
	290	173	
	291	75	262
	292	89	
	293	168	
	294	120	377
			639
J. A. Bradtke, Yongala.	295	12	
	296	—	
	297	136	
		148	
W. H. A. Hodgson, Salisbury.	298	156	
	299	153	
	300	158	
		467	
A. W. McDonald, Gawler.	301	58	
	302	129	
	303	140	
		327	
J. H. Dowling, Glossop.	304	125	
	305	138	
	306	21	
		284	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
	307	123	
A. P. Urlwin,	308	99	
Balaklava.	309	25	
		247	
	310	134	
L. S. Ekers,	311	44	
Mount Compass.	312	141	
		319	
	313	160	
V. E. Williams,	314	156	
Semaphore Park.	315	161	
		477	
	316	156	
F. P. Munzberg,	317	143	
Tanunda.	318	158	
		457	
Total Class 1		33,995	

Class 2—Any Other Light Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.
	319	102
Langmaid & Bettison,	320	70
Salisbury.	321	138
(Black Minorcas.)		310
	322	138
A. Heaysman,	323	175
Government Road,	324	102
Eden Hills.		
(Cuckoo Leghorns.)		415
Total Class No. 2.		725

Class No. 3—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
	325	51	
	326	29	
	327	148	228
A. G. Dawes, 230,	328	107	
Portrush Road,	329	106	
Glenunga.	330	125	338
			566
	331	155	
	332	135	
	333	137	427
H. J. Mills,	334	126	
108, Edward Street,	335	157	
Edwardstown.	336	dead	283
			710
	337	133	
	338	108	
	339	75	316
K. Pennack,	340	168	
Pooraka.	341	64	
	342	108	330
			646
	343	122	
	344	100	
	345	110	332
H. H. Gallagher,	346	127	
Pooraka.	347	108	
	348	41	276
			608
	349	26	
B. Cooke,	350	44	
Kanmantoo.	351	32	
		102	
	352	126	
H. H. Hefford,	353	93	
Murray Bridge.	354	58	
		277	
J. H. Dowling,	355	100	
Glossop.	356	42	
	357	124	
		266	
L. S. Ekers,	358	120	
Mount Compass.	359	81	
	360	139	
		340	
/	452	79	
A. G. Dawes,	453	102	
230, Portrush Road,	454	99	280
Glenunga.	455	46	
	456	134	
	457	125	305
			585
A. P. Urlwin,	465	100	
Balaklava.	466	143	
	467	103	
		346	
Total Class No. 3		4,344	

Class No. 4.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 22nd Dec., 1935.	
	361	1	
H. J. Mills,	362	dead	
108, Edward Street,	363	72	73
Edwardstown.	364	182	
(Rhode Island Reds.)	365	99	
	366	dead	281
			354
	367	81	
	368	114	
A. G. Dawes,	369	77	272
230, Portrush Road,	370	129	
Glenunga.	371	81	
(Rhode Island Reds.)	372	114	324
			596
	373	129	
	374	144	
F. F. Welford,	375	dead	273
1, Ludgate Circus,	376	48	
Colonel Light Gardens.	377	118	
(Rhode Island Reds.)	378	120	286
			559
	379	65	
	380	142	
V. F. Gameau,	381	135	342
Findon Road,	382	110	
Woodville.	383	25	
(Rhode Island Reds.)	384	79	214
			556

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 24th Dec., 1935.	
K. Pennack, Pooraka. (Barneveldera.)	385	128	
	386	113	
	387	99	340
	388	141	
	389	132	
	390	125	398
			738
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	458	19	
	459	106	
	460	118	243
	461	15	
	462	121	
	463	105	241
			484
Total Class No. 4			3,287

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 24th Dec., 1935.	
G. R. Cowell, Balhannah.	391	149	
	392	67	
	393	dead	216
	394	78	
	395	50	
	396	118	246
			462
A. J. Monkhouse, Woodside.	397	41	
	398	145	
	399	138	324
	400	85	
	401	131	
	402	141	357
			681
G. R. Cowell, Balhannah.	403	132	
	404	128	
	405	52	312
	406	122	
	407	80	
	408	dead	202
			514
Total Class No. 5			1,657

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 24th Dec., 1935.
W. R. Christie, Upper Mitcham.	409	111
	410	102
	411	105
		318
Total Class No. 7		318

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 24th Dec., 1935.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	127
	413	50
	414	103
		280
Total Class No. 8		280

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 24th Dec., 1935.
Peter Western, Ascot Park School. (White Leghorn.)	415	164
Peter Western, Ascot Park School. (White Leghorn.)	416	154
William Sando, Echunga School. (White Leghorn)	417	142
Douglas Marshall, Yundi School. (White Leghorn.)	418	147
Norman Page, Murray Bridge School. (White Leghorn.)	419	141
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	118
Dean Colwell, Grange School (White Leghorn.)	421	117
Warren Hannaford, Paracombe School (White Leghorn.)	422	168
W. Horne, Woodville School. (White Leghorn.)	423	dead
Owen Robinson, Ascot Park School. (White Leghorn.)	424	145
June Chapman, Woodchester School. (White Leghorn.)	425	121
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	90
Jack O'Sullivan, Morphett Vale School. (White Leghorn)	427	117
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	61
James Taylor, Morphett Vale School. (White Leghorn.)	429	142
William Gregory, Victor Harbour School. (White Leghorn)	430	119
Ian Bruce, McLaren Flat School. (White Leghorn)	431	124
Clifford Burford, Smithfield School. (White Leghorn.)	431	89
Tom Callaghan, Smithfield School. (White Leghorn.)	433	34
Eric Pratt, Abattoirs School. (White Leghorn.)	434	176
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	150
Alan Yelland, Cunliffe School. (Minorca.)	436	82
Gordon Galiasch, Gilles Plains School. (White Leghorn.)	437	154

Egg-laying Competition—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 24th Dec., 1935.
Clarence King, Tarlee School. (White Leghorn.)	438	80
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	111
Donald Heading, Sturt School. (Black Orpington.)	440	142
Olive Steer, Sturt School. (Black Orpington.)	441	134
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	156
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	145
Ray Candy. Noarlunga School. (Black Orpington.)	444	63
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	147
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	136
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	33
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	69
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	125
John Keldoulis, Orroroo School. (Black Orpington.)	450	139
Bruce Dooland, Thebarton School. (Black Orpington.)	451	111
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	91
Total		4,437

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. Anderson, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April to 31st December, 1935.

Feeding Tests commenced on 1st April, 1935.

1. **Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.**
2. **Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.**
3. **Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.**
4. **Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.**
5. **Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.**

	No. Eggs Laid 1st April, 1935, to 30th November, 1935.	No. Eggs Laid Month of December, 1935.	Total Eggs Laid 1st April, 1935, to 31st December, 1935.
No. 1 Test	4,993	515	5,508
No. 2 Test	5,047	666	5,713
No. 3 Test	5,236	700	5,936
No. 4 Test	4,500	425	4,925
No. 5 Test	4,556	496	5,052

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on 2nd January, 1936:—

BUTTER.—The year ended has been more satisfactory to producers than for some time past, as the prices obtained for dairy produce have been better and, with rates for wheat having moved upwards, the position of farmers has been improved. Prices for butter in London touched as low as 63s. per cwt. during the 1934 season, whereas the lowest point reached in 1935 was 70s. per cwt. Production in this State is now steadily declining, but a record tonnage of butter was produced in the aggregate for the season. London rates have moved upwards slightly and at present are 95s. to 96s. per cwt., but there has been no alteration in local prices recently. Choicest creamery fresh butter, in bulk, 1s. 3¼d. per lb.; prints and delivery, extra. (This price is for local sale only and, under the quota system, the equalised price manufacturers will receive will be 1s. $0^{3}/_{32}$d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines, from 10½d. to 11½d. per lb. for choicest; stores, 6d. to 8d. per lb. (These prices are subject to equalisation levies.)

EGGS.—Many of the consignments received during the last few weeks have been weather affected, although there was a strong demand for best quality new laid eggs; off conditioned were not so readily saleable. Present rates are:—Ordinary country eggs, fair average quality, 3d. per doz. net; long distance rail or shipping eggs, lower; selected new laid, clean eggs, full-sized, 7d. to 7½d. per doz. net.

BACON.—After the heavy demand for hams just prior to Christmas there has been a lull in the trade, although the sale of bacon has kept up fairly well throughout, varying according to climatic conditions. Values are:—Best quality sides, 9½d. to 9¾d. per lb.; middles, 9½d. to 10d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 1s. 2½d. to 1s. 3d.; cooked, 1s. 4½d. to 1s. 5½d. per lb; lard, bulk, 5d. to 5½d.; prints, 6d. to 6½d. per lb

ALMONDS.—Stocks held by growers are now very light, and the consignments received during December were not heavy and were all cleared. The new crop will not be available until February and promises to be a moderately good one. Quotations at present are nominally:—Softshells and Brandis, 9d. to 9½d.; hardshells, 5¼d. to 5½d.; kernels, 1s. 10d. to 1s. 10½d. per lb.

HONEY.—Market continues dull with heavy carry-over stocks and the outlook is not very promising. Quotations remain unchanged at:—Prime quality clear extracted, 2¼d. to 2¾d. per lb; lower grades, 1d. to 2d. per lb.

BEESWAX.—Moderate to good trading continued for this commodity and values were without alteration, being 1s. 3d. to 1s. 4d. per lb., according to quality.

LIVE POULTRY.—Auction sales held every Tuesday, Wednesday, Thursday, and Friday at our salerooms, which are in every way the best equipped in the State. As usual during December the catalogues submitted were very heavy, but the greater proportion of the birds consigned were not altogether suitable for table purposes. Fowls of the Leghorn type are rather small for this purpose, but for prime quality, heavyweight stock there was always keen competition. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 4s. to 5s.; nice conditioned cockerels, 3s. to 3s. 11d.; fair conditioned cockerels, 2s. 6d. to 2s. 11d.; chickens, lower; heavyweight hens, 2s. 4d. to 3s. 3d.; medium hens, 1s. 8d. to 2s. 3d.; light hens, 10d. to 1s. 6d.; couple of pens of weedy sorts, lower. Prime young Muscovy drakes, 5s. to 6s.; young Muscovy ducks, 3s. to 4s.; ordinary ducks, 1s. to 2s. 3d.; ducklings, lower. Geese, 2s. 9d. to 4s.; goslings, lower. Turkeys, good to prime condition, 9d. to 1s. per lb. live weight; turkeys, fair condition, 6d. to 8d. per lb. live weight; turkeys, poor and crooked breasted, lower. Pigeons, 3d. to 4½d. each.

POTATOES.—New season's, 7s. per cwt.

ONIONS.—New season's, 7s. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of December, 1935, also the average precipitation for December, and the average annual rainfall.

Station.	Dec. 1935.	Av'ge. for Dec.	To end Dec. 1935.	Av'ge. Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	—	0·47	4·03	4·62
Marree	0·12	0·73	4·30	5·83
Farina	—	0·57	4·25	6·37
Copley	0·28	0·75	3·44	7·85
Beltana	0·23	0·80	3·25	8·47
Blinman	0·30	0·89	4·47	11·81
Hookina	0·08	1·09	4·23	11·18
Hawker	0·12	0·87	5·47	12·22
Wilson	0·55	0·91	5·96	11·77
Gordon	0·47	0·89	5·59	10·46
Quorn	0·74	0·79	10·45	13·15
Port Augusta	0·36	0·59	8·92	9·40
Bruce	0·65	0·85	7·55	9·74
Hammond	0·41	0·85	7·80	11·11
Wilmington	0·83	0·89	11·85	17·28
Willowie	0·62	0·86	8·03	12·22
Melrose	0·97	1·03	19·41	22·85
Booleroo Centre	0·65	0·97	11·55	15·21
Port Germein	0·57	0·81	11·31	12·53
Wirrabara	0·87	1·01	17·49	19·25
Appila	0·96	0·99	13·03	14·62
Cradock	0·31	0·89	5·53	10·78
Carrieton	0·42	0·99	7·77	12·19
Johnburg	0·27	0·94	6·96	10·56
Eurelia	0·30	0·89	7·33	12·76
Orroroo	0·35	0·84	8·19	13·20
Nackara	0·67	0·92	7·72	11·09
Black Rock	0·24	0·85	7·33	12·35
Oodlawirra	0·27	1·24	6·51	11·67
Peterborough	0·33	1·01	8·86	13·22
Yongala	0·65	1·06	11·32	14·43
NORTH-EAST.				
Yunta	0·40	0·73	6·58	8·48
Waukaringa	0·47	0·67	4·79	7·89
Mannahill	0·42	0·73	4·67	8·16
Cockburn	0·12	0·64	3·46	7·91
Broken Hill	0·34	0·81	4·87	9·50
LOWER NORTH.				
Port Pirie	1·19	0·77	12·82	13·19
Port Broughton	1·07	0·66	14·76	13·85
Bute	0·85	0·72	15·78	15·39
Laura	0·64	0·89	15·64	17·97
Caltowie	0·74	0·96	12·83	16·76
Jamestown	0·78	1·08	15·22	17·72
Gladstone	1·16	0·88	15·45	16·32
Crystal Brook	1·15	0·89	17·43	15·76
Georgetown	1·17	0·96	15·01	18·29
Narridy	0·97	0·87	14·24	15·77
Redhill	0·76	0·85	16·95	16·54
Spalding	0·83	1·18	16·57	18·74
Gulnare	1·04	1·03	16·15	18·59
Yacka	1·09	0·91	15·14	15·38
Koolunga	0·55	0·93	13·61	15·32
Snowtown	0·84	0·77	15·27	15·70
LOWER NORTH—*continued*.				
Brinkworth	0·53	0·92	15·21	15·73
Blyth	0·65	0·93	16·87	16·73
Clare	0·96	1·14	23·45	24·45
Montaro	0·50	1·17	20·75	23·36
Watervale	0·62	1·29	23·68	26·74
Auburn	0·68	1·08	21·37	23·96
Hoyleton	0·45	0·88	15·77	17·27
Balaklava	0·50	0·82	14·13	15·43
Port Wakefield	0·44	0·63	12·85	12·93
Terowie	0·42	1·05	9·48	13·34
Whyte-Yarcowie	0·77	0·87	11·06	13·58
Hallett	1·16	1·00	15·70	16·41
Mount Bryan	0·33	1·04	16·38	16·77
Kooringa	0·40	0·96	15·76	17·81
Farrell's Flat	0·33	1·00	17·26	18·54
WEST OF MURRAY RANGE.				
Manoora	0·70	1·09	17·63	18·94
Saddleworth	0·68	1·00	17·51	19·59
Marrabel	0·50	0·99	17·60	19·96
Riverton	0·95	0·95	20·84	20·79
Tarlee	0 50	0·95	16·51	18·09
Stockport	0·47	0·94	19·37	16·97
Hamley Bridge	0·39	0·94	16·69	16·52
Kapunda	0·96	1·01	17·79	19·76
Freeling	0·52	0·93	18·05	17·79
Greenock	0·53	1·08	21·10	21·47
Truro	0·43	0·92	17·70	19·79
Stockwell	0·55	1·02	19·13	20·04
Nuriootpa	1·31	1·08	23·86	20·68
Angaston	0·55	1·08	22·74	22·32
Tanunda	0·56	0·99	23·71	21·94
Lyndoch	0·40	1·03	23·52	23·27
Williamstown	0·42	1·08	23·83	27·61
ADELAIDE PLAINS.				
Owen	0·50	0·69	16·15	14·64
Mallala	0·51	0·85	13·60	16·49
Roseworthy	0·47	0·85	18·21	17·42
Gawler	0·90	0·88	18·96	18·85
Two Wells	0·63	0·83	18·16	15·76
Virginia	0·67	0·92	17·99	17·20
Smithfield	0·77	0·88	18·94	17·65
Salisbury	0·68	0·87	17·89	18·56
Adelaide	1·16	1·00	23·45	21·14
Glen Osmond	0·65	1·18	25·73	25·97
Magill	0·56	1·23	24·91	25·37
MOUNT LOFTY RANGES.				
Teatree Gully	0·72	1·27	25·31	27·07
Stirling West	0·87	1·86	50·14	46·95
Uraidla	0·48	1·77	38·97	43·95
Clarendon	0·64	1·39	34·05	32·79
Happy Val'y Res.	0·74	—	26·10	—
Morphett Vale	0·58	0·96	23·70	22·59
Noarlunga	0·56	0·78	21·93	20·33
Willunga	0·42	0·92	24·89	25·97
Aldinga	0·48	0·80	20·05	20·21

RAINFALL—*continued.*

Station.	Dec. 1935.	Av'ge. for Dec.	To end Dec. 1935.	Av'ge. Annual Rain-fall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	0·67	1·08	35·93	29·42
Inman Valley	0·57	—	33·00	—
Yankalilla	0·78	0·86	23·15	22·76
Mount Compass	0·55	—	34·49	—
Mount Pleasant	0·68	1·05	24·95	27·11
Birdwood	0·50	1·20	26·66	29·07
Gumeracha	0·67	1·35	31·11	33·31
Millbrook Res.	0·54	1·60	34·82	34·47
Tweedvale	0·73	1·37	37·18	35·91
Woodside	0·54	1·27	32·46	32·15
Ambleside	0·68	1·37	37·30	34·77
Nairne	0·63	1·16	29·06	28·12
Mount Barker	0·70	1·26	31·81	31·24
Echunga	0·74	1·29	36·49	33·25
Macclesfield	0·65	1·22	31·65	30·34
Meadows	0·47	1·39	36·08	36·02
Strathalbyn	0·81	0·86	21·29	19·32
MURRAY FLATS AND VALLEY.				
Meningie	0·13	0·81	17·11	18·31
Milang	0·31	0·69	12·66	14·89
Langhorne's Ck	1·08	0·79	15·91	14·91
Wellington	0·52	0·80	15·08	14·65
Tailem Bend	0·39	0·93	15·36	15·06
Murray Bridge	0·24	0·77	12·20	13·51
Callington	0·48	0·81	14·35	15·15
Mannum	0·33	0·62	12·05	11·48
Palmer	0·43	0·83	16·88	15·59
Sedan	0·45	0·63	9·96	12·05
Swan Reach	0·61	0·71	9·71	10·65
Blanchetown	0·60	0·71	8·49	11·01
Eudunda	0·74	0·94	16·11	17·15
Point Pass	0·49	0·93	15·94	16·72
Sutherlands	0·31	0·70	7·11	10·81
Morgan	0·14	0·76	6·20	9·16
Waikerie	0·34	0·75	7·22	9·66
Overland Corner	0·49	0·76	6·08	10·25
Loxton	0·40	0·81	7·26	11·50
Berri	0·73	0·86	7·97	10·13
Renmark	0·78	0·79	8·30	10·38
WEST OF SPENCER'S GULF.				
Eucla	0·48	0·50	13·83	10·02
Nullarbor	0·19	0·41	9·75	8·85
Fowler's Bay	0·33	0·30	12·74	11·91
Penong	0·87	0·46	14·36	12·22
Koonibba	0·92	0·51	14·41	12·09
Denial Bay	0·66	0·35	12·57	11·19
Ceduna	0·39	0·41	13·37	10·21
Smoky Bay	0·06	0·46	11·85	10·42
Wirrulla	0·58	0·42	15·17	10·51
Streaky Bay	0·14	0·42	18·79	14·85
Chandada	0·08	0·31	14·08	12·42
Minnippa	0·45	0·60	15·18	13·91
Kyancutta	0·86	0·32	17·17	12·77
Talia	0·96	0·57	15·98	14·76
Port Elliston	0·35	0·49	17·50	16·51
Lock	0·97	0·73	18·51	16·34
Mount Hope	0·64	—	22·83	—
Yeelanna	0·43	0·52	19·57	15·94
Cummins	0·31	0·59	20·11	17·58
Port Lincoln	1·32	0·67	18·08	19·37
Tumby	0·75	0·74	15·37	14·25
Ungarra	0·88	0·73	18·66	16·87
Port Neil	0·63	0·75	14·46	13·11
WEST OF SPENCERS GULF—*continued.*				
Arno Bay	0·63	0·63	15·61	12·71
Rudall	0·71	0·47	15·70	12·98
Cleve	0·83	0·68	19·20	14·88
Cowell	0·57	0·52	10·70	11·07
Miltalie	0·97	0·60	16·03	13·70
Mangalo	0·91	0·62	14·00	13·86
Darke's Peak	0·85	0·75	18·46	15·08
Kimba	0·59	0·50	14·13	11·68
YORKE PENINSULA.				
Wallaroo	0·83	0·59	13·79	13·97
Kadina	0·74	0·66	15·22	15·60
Moonta	0·83	0·67	14·08	15·06
Paskeville	0·71	0·67	14·08	15·47
Maitland	0·87	0·77	20·38	19·85
Ardrossan	0·76	0·57	14·61	13·95
Port Victoria	0·69	0·67	14·19	15·41
Curramulka	0·96	0·72	17·68	17·81
Minlaton	0·89	0·62	16·94	17·74
Port Vincent	0·69	0·66	14·19	14·38
Brentwood	0·98	0·60	17·97	15·54
Stansbury	0·99	0·59	17·26	16·81
Warooka	1·05	0·54	17·41	17·44
Yorketown	0·89	0·59	20·12	16·83
Edithburgh	0·70	0·61	16·93	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	0·81	0·77	29·08	24·80
Kingscote	0·53	0·73	25·12	19·16
Penneshaw	0·39	0·82	23·13	19·00
Victor Harbour	1·81	0·85	23·12	21·40
Port Elliot	1·97	0·82	19·85	19·94
Goolwa	0·63	0·77	16·59	17·86
Maggea	0·41	0·74	8·37	10·20
Copeville	0·64	0·83	11·13	11·53
Claypans	0·53	0·91	11·36	10·42
Meribah	0·23	0·77	8·23	11·32
Alawoona	0·25	0·70	8·54	10·40
Caliph	0·38	0·45	7·69	10·98
Mindarie	0·35	0·81	10·23	12·23
Sandalwood	0·53	0·90	12·80	13·64
Karoonda	0·32	0·95	14·32	14·17
Pinnaroo	0·36	0·84	9·43	14·36
Parilla	0·53	0·77	11·75	13·72
Lameroo	0·58	0·92	13·00	15·87
Parrakie	0·59	0·87	16·09	14·56
Geranium	0·83	0·98	17·34	16·36
Peake	0·12	0·92	16·37	15·93
Cooke's Plains	0·70	0·82	15·91	15·28
Coomandook	0·54	0·79	16·95	17·03
Coonalpyn	0·37	0·91	19·62	17·61
Tintinara	0·26	1·04	20·32	18·62
Keith	0·32	0·97	18·72	17·93
Bordertown	0·56	1·02	18·76	19·14
Wolseley	0·57	0·94	18·28	18·47
Frances	0·51	0·18	21·87	20·08
Naracoorte	0·54	1·13	24·21	22·63
Penola	0·42	1·31	23·85	25·96
Lucindale	0·50	1·13	28·42	23·38
Kingston	0·34	1·10	24·32	24·24
Robe	0·38	1·02	24·91	24·64
Beachport	0·45	1·13	27·54	27·06
Millicent	0·72	1·28	32·57	29·83
Kalangadoo	1·01	1·42	29·06	32·20
Mount Gambier	0·78	1·61	27·72	30·37

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page.	Dates of Meetings.	
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Aldinga	*	—	—
Allandale East	854	14	6
Alma	*	—	—
Angaston	*	—	—
Appila-Yarrowie	854	7	6
Arthurton	*	—	—
Ashbourne	*	5	4
Auburn Women's	864	28	27
Balaklava	*	24	23
Balhannah	*	—	—
Balhannah Women's	864	—	—
Balumbah	855	—	—
Balumbah Women's	865	R	4
Barmera	*	—	—
Barootа	854	10	9
Beetaloo Valley	*	3	2
Beetaloo Valley Women's	864	—	—
Belalie Women's	864	R	10
Belvidere	*	—	—
Berri	*	3	2
Blackheath	855	13	12
Black Rock	*	—	—
Black Springs	*	—	—
Blackwood	*	10	9
Block E	*	—	—
Blyth	*	28	27
Booborowie	*	3	2
Booleroo Centre	*	28	27
Boolgun	*	—	—
Boor's Plains	839	—	—
Boor's Plains Women's	862	—	—
Brentwood	*	3	2
Brimpton Lake	*	—	—
Brinkley	*	5	4
Brownlow	852	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	854	20	19
Butler	*	—	—
Calca	*	—	—
Caliph	*	4	3
Carey's Gully	852	—	—
Chandada	*	—	—
Chapman's Bore	*	10	9
Cherry Gardens	855	—	—
Chilpuddie Rock	*	—	—
Clare Women's	864	1	7
Clarendon	*	3	30
Collie	*	5	4
Coomandook	*	R	27
Coonalpyn	855	—	—
Coonalpyn Women's	863	R	4
Coonawarra	849	6	5
Coonawarra Women's	*	19	18
Cummins	*	14	13
Cungena	*	6	5
Currency Creek	855	10	9
Devlin's Pound	855	—	—
Devlin's Pound Women's	864	5	11
Dudley	*	—	—
Echunga	*	12	11
Eurelia	854	8	14
Eurelia Women's	864	5	4
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Frayville	855	—	—
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Georgetown Women's	*	11	10
Gladstone	854	7	6
Gladstone Women's	864	18	13
Goode	*	R	—
Goode Women's	*	—	—
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Greenock	854	17	16
Gumeracha	*	10	9
Hanson	854	4	3
Hartley	855	5	4
Hilltown	854	4	3
Hindmarsh Island	*	—	—
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Hope Forest Women's	864	—	—
Inman Valley	*	20	19
Iron Bank	855	5	4
Jamestown	*	19	18
Jervois	*	13	12
Kalangadoo	*	8	14
Kalangadoo Women's	863	8	14
Kangarilla Women's	864	20	19
Kanni	*	—	—
Karte	850	—	—
Karte Women's	856	—	—
Kelly	860	1	7
Ki Ki	*	—	—
Kilkerran	*	6	5
Koolunga	*	—	—
Koonunga	849	—	—
Koppio	*	5	11
Kulkawirra	*	11	10
Kyancutta	*	4	3
Kybybolite	*	6	5
Kybybolite Women's	864	—	—
Lameroo	855	1	7
Laura	*	8	7
Laura Bay	842	11	10
Laura Bay Women's	864	14	14
Lenswood and Forest Range	*	—	—
Light's Pass	854	—	—
Lipson	*	1	7
Lone Gum and Monash	853	20	19
Lone Pine	*	3	2
Longwood	855	—	—
Lyndoch	*	4	3
MacGillivray	*	4	3
McLaren Flat	*	—	—
McLaren Flat Women's	*	6	5
Maltee	855	6	5
Maltee Women's	864	—	—
Mangalo	*	—	—
Mangalo Women's	863	12	11
Marama	*	—	—
Milang	*	8	7
Millicent	*	28	27
Millicent Women's	864	R	—
Miltalie	854	1	7
Minnipa	*	—	—
Monarto South	855	—	—
Monarto South Women's	864	15	21
Moorlands	*	5	11
Moorook	*	—	—
Morchard		7	6
Morchard Women's	864	26	25
Mount Barker	*	17	16
Mount Bryan	854	—	—
Mount Compass	*	—	—
Mount Gambier	854	14	13
Mount Hope	855	4	3
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Murraytown	*	—	—
Mypolonga	*	—	—
Myponga	863	20	19
Myponga Women's	864	18	12
Nantawarra	848	6	5
Narridy	*	1	—
Narridy Women's	863	—	—
Narrung	*	—	—
Nelshaby	*	—	—
Nelshaby Women's	*	—	—
Nunjikompita	*	6	5
Nunkeri	*	6	5
O'Loughlin	*	10	9
O'Loughlin Women's	864	—	—
Owen	*	10	9
Palabie	*	—	—
Parilla	*	18	17
Parilla Women's	*	19	18
Parilla Well	*	10	9
Parilla Well Women's	*	25	31
Parrakie	*	—	—
Parrakie Women's	*	25	31
Paskeville	*	4	3
Penola	*	1	7
Penola Women's	*	—	—
Penwortham	*	5	4
Petina	*	22	28
Pinbong	*	—	—
Pinbong Women's	863	—	—
Pinkawillinnie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	864	7	6
Port Elliot	*	—	—
Pygery	855	4	3
Pygery Women's	*	11	10
Ramco	*	3	2
Redhill	*	—	—
Rendelsham	854	1	5
Rendelsham Women's	864	—	—
Renmark	*	—	—
Riverton	*	10	9
Roberts and Verran	*	—	—
Rosedale	854	—	—
Roseworthy	*	—	—
Saddleworth	*	7	6
Saddleworth Women's	863	4	3
Scott's Bottom	855	1	7
Sheoak Log Women's	864	R	—
Shoal Bay	855	4	3
Snowtown	*	14	13
Snowtown Women's	857	6	5
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Stanley Flat	*	17	16
Stockport	854	—	—
Strathalbyn	*	12	11
Sutherlands	844	—	—
Tantanoola	854	1	7
Tantanoola Women's	864	5	4
Taplan	*	R	3
Taplan Women's	*	—	—
Taragoro	855	R	5
Tarlee	*	—	—
Tatiara	*	—	—
Truro	854	17	16
Tweedvale	*	20	19
Tweedvale Women's	*	17	16
Ungarra	855	—	—
Upper Wakefield	854	—	—
Wallala	854	12	11
Wandearah	*	4	3
Warcowie	*	4	3
Warcowie Women's	864	R	—
Warramboo	*	4	3
Warramboo Women's	864	—	—
Wasleys	*	18	12
Wasleys Women's	864	6	5
Watervale	*	17	16
Weavers	*	10	9
Wepowie	*	3	2
Wepowie Women's	*	—	—
Whitwarta	*	R	16
Wilkawatt Women's	*	18	17
Williamstown	854	—	—
Williamstown Women's	863	5	4
Willowie	*	24	23
Wilmington	854	18	17
Wilmington Women's	864	18	12
Wirrabara	*	—	—
Wirrabara Women's	864	20	19
Wirrilla	*	6	5
Wirrilla Women's	863	6	5
Wolseley	854	8	14
Wudinna	*	—	—
Yadnarie	*	4	3
Yandiah	*	14	13
Yeelanna	*	5	4
Younghusband	*	—	—
Yundi	855	—	—
Yurgo	864	—	—
Yurgo Women's		—	—

* No report received during the month of December R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

MILLING VALUES OF WHEATS.

Paper read by S. G. Chynoweth at a meeting of Boor's Plains Branch on 5th September.

In the following table are given the average bushel-weight, flour yield, and flour strength of a number of different varieties of wheat. By the term flour strength should be understood the amount of water in quarts required by the 200-lb. sack of flour to make a dough of the proper consistency for baking. The figures, therefore, give the water absorbing power of the flour, which is the most ready and reliable means of determining what is understood by the baker under the term "flour strength." The classification is that adopted in the entries competing for prizes at the Royal Agricultural Society's Show, and includes the three principal classes under which wheat is entered for competition. The "Australian Strong White" class comprises several of Farrer's crosses made with the specific object of providing a hard, strong flour, and white grain, as distinguished from the ordinary hard wheats, which are usually red in colour. It is to the introduction of this class that the greatly improved milling quality of local wheat is due. Australian, and particularly New South Wales wheat, now enjoys a high reputation for milling excellence on the English market, and possesses pre-eminently the valuable characteristic of being suitable for milling without previous blending with other kinds. It is always of excellent colour, and is a strong favourite with English millers on this account. It must be understood that the figures given represent averages taken over a number of yeasr. These figures will vary considerably in different samples, and also in different seasons.

Table Showing Milling Values of Wheat.

Variety.	Weight per Bushel.	Percentage of Flour.	Flour Strength.	Perentage of Dry Gluten.
Australian Strong White Wheats—	Lbs.			
Pusa No. 4	66½	72.3	54.5	12.2
Comeback	66½	74.0	52.6	12.6
Bobs	66½	74.0	50.0	12.7
Medium Strong Wheats—				
Hard Federation	65½	73.3	49.1	11.7
Florence	65¾	73.2	48.0	14.7
Quality	66½	75.0	46.5	12.5
Canberra	66½	73.1	45.0	11.7
Clarendon	65½	75.9	45.0	14.9
Union	64	73.4	44.6	10.3
Cleveland	64	73.6	44.4	12.6
Gresley	67½	72.6	44.4	8.6
Bena	65	72.3	44.2	10.0
Weak Flour Wheats—				
Waratah	65¾	72.8	44.0	10.6
Federation	65½	71.3	44.0	9.5
Major	65	73.9	43.6	9.2
Petatz Surprise	67¾	73.2	43.2	10.0
Furbey	64½	72.4	43.2	9.5
Purple Straw	65½	72.0	42.4	7.3
Gallipoli, Free Gallipoli, Ghurka, Nabawa, rejected by the millers.				

Factors which Lower Quality.—Whilst it may be argued, and correctly so, that so necessary a commodity as wheat must always find a purchaser at a price, there can be no doubt that it is the highest quality article that gives the greatest return. This being the case, growers should endeavour to avoid, as far as possible, producing samples which are defective from the miller's point of view. The chief defects in grain intended for the flour mill, and methods by which their occurrence may be avoided are as follows:—

Smut.—Smut as it is commonly called, or bunt, is a fungus disease, having a very serious residual effect on wheat from a milling point of view, and one which causes considerable losses by reducing the value. It is impossible to determine a definite figure for smut loss, but every grower is aware of its seriousness, either through personal experience or from that of a neighbour. Smutty wheat is treated harshly by millers, as it is very difficult to handle, although certain "smutting" machines will make a fair sample of infected grain, but at a considerable cost. There is no excuse now for smutty wheat, however, as practically complete control is secured by treatment of the seed by dry copper carbonate powder, at the rate of 2ozs. to the bushel of seed.

Damaged Grain.—The presence of damaged grains in a sample of wheat reduces the milling value very considerably. They have serious effects on the quality of the flour, causing a bad colour, imparting an objectionable taint, and reducing its keeping qualities. Furthermore, these damaged grains cannot be removed. The most serious are those that have been heat damaged, but fortunately they are not common under Australian bagged conditions. They are mostly caused by harvesting the wheat while it is unripe, but the majority of growers are sufficiently alive to the necessity of harvesting when the grain is matured, thus largely obviating the danger of this objectionable condition. This trouble is frequently caused by standing bags of wheat in the paddock without placing sufficient logs (and in some cases none at all) for a foundation. If the ground is damp, or if rain should fall, the bottoms of the bags become wet and the wheat is spoilt.

Damaged Patches—These are viewed seriously, and to remove them it frequently happens that a section of the bag is cut away with the bad grain adhering. This causes the bag to be valueless, and is productive of much waste of grain. It is a source of considerable expense, whereas a little care would have saved to the grower the full original value of the wheat.

Bleached, Sprung, and Shot Wheat.—These defects are all caused by excessive external moisture conditions when the grain is just ripening or ripe, and they might be described as three stages of the one complaint—each causing a reduction in value according to the severity of the damage. Such weathering is difficult to control, being largely dependent on climatic condition. An alleviation may be secured by close attention to the sowing of suitable varieties at the right time, by harvesting as expeditiously as possible when the grain is ready, and by sowing fine type varieties free from grain of a different maturing period, so that all ripens at the one time. Bleached wheat is recognised by the loss of colour, for it has a pale, anaemic, and lifeless appearance, with an attendant considerable loss in weight. Sprung wheat is distinguished by the above symptoms together with a bloated appearance of the germ, whilst shot wheat is similar, but with the germs sprouted. Each of the three defects is disliked by millers, the wheat being difficult to store for any length of time, and the flour being much reduced in strength.

Admixtures.—Star thistles, drake, barley, black oats, &c., in quantity constitute a strong objection and thereby reduce the value of the wheat Chaff, white heads, straws, thistle heads, and broken grain are objectionable and are present as the result of faulty setting or operating of the harvester machinery. With a header a minimum of straw should be taken, otherwise it is likely that the sieves will become blocked. It is essential that sieves, beaters, and peg drums be correctly adjusted, and, as far as possible, the machine should be kept moving at a regular pace. These admixtures cause a lot of unnecessary loss and additional work. In the first place the wheat will show a considerably lighter chondrometer weight, bringing the value down immediately; then the bulk of stuff causes a wastage of bags, undue handling, a loss of freight, as the material is practically worthless, and finally it causes additional work and expense at the mill for separating and cleaning

Diseases.—Rust has a very serious indirect effect, as by its action the plant is prevented from supplying the grain with the requisite food material, causing it to be thin and pinched. Such grain, as in other cases of light grain, is relatively low in value. Growers will recollect that in 1916-1917 the f.a.q. weight, in many cases, was light through this cause. Foot-rot, take-all, flag and loose smut, &c., do not themselves directly affect the grain, although whatever grain may form on plants so affected will be found to be pinched and damaged and of little value.

Red Wheat.—As mentioned previously, Australian wheat is prized partly on account of its colour, and is in demand for blending purposes. European buyers have taken exception to the presence of red grain. In view of this it was decided that red wheat should be eliminated from the f.a.q. standard for purposes of export. Consequently it is utmost importance that growers should keep red wheat out of their consignments. (Secretary, S. G. Chynoweth.)

Boor's Plains Agricultural Bureau Field Day.

TYPE OF SHEEP FOR THE FARM.

At a meeting of the South Kilkerran Branch on 2nd September, the Secretary read the following paper:—

The type of sheep for the farmer chiefly depends on the locality in which they are depastured. For instance, in the drier districts it is a mistake to try and keep anything but Merino sheep; they are the most valuable wool producers, and can live on less feed than the English crossbred. It is always advisable to have the best of its kind, as one can always sell a good sheep, whereas he may not be able to sell an inferior sheep.

In the case of the farmer who runs sheep chiefly to keep his land clean, and to get what profits come as a natural result from depasturing them, the chances are that he will buy sheep rather than breed them. In 99 cases out of 100 it is a mistake to buy rubbish. It pays better to buy from a good flock even if they are culls. If one wishes to breed there is no question about the advisability of having good stock to commence with.

It should be the object of the breeder to produce sheep that will build up not only his own flock, but the flocks of his country. The strong woolled Merino growing a good lengthy staple of moderate density is the most profitable in our district.

The blowfly has now become a very serious pest to the sheepfarmer, so much so that many ewes and lambs are lost each year from this cause. The question has frequently been asked, "What is the best thing to do to cope with the trouble," and the best answer is "Prevention is better than cure." To prevent lambing ewes being attacked by the blowfly, it is absolutely necessary to have them breeched and crutched some time before lambing. Bring in the ewes three or four weeks before lambing, and while breeching use great care not to worry the ewe more than necessary. It is a common but bad practice to catch a ewe by the leg. This should not be done. She should be picked up carefully in the arms and sat down.

It is no excuse to say that during lambing time the farmer is too busy to devote any time or care to the ewes. The farmer is keeping his sheep for the purpose of making money, and it will surely pay him to give a little time and attention to the care of his ewes at this period, as by doing so he will increase his percentage of lambs. No matter whether the ewes are old or young, it is the correct thing frequently to walk quietly through the lambing paddock and be at hand to give the assistance that is often required, more especially in the case of young ewes. Care should be taken, however, not unduly to disturb the ewes at this time.

About four to six weeks after the lambs are dropped is the usual time for tailing. One should choose a fine warm day, and start abourt 9 or 10 o'clock in the morning. That gives the lambs a chance to recover a little before the cold of the evening sets in. Care should also be taken not to chase the lambs about too much after being tailed; the quieter they are driven the better.

Dipping sheep is another important thing; it kills tick and other parasites, and also acts as a tonic to the skin. The bath should be well stirred before starting, and the skin should be thoroughly soaked. A large amount of money is lost to some farmers through negligence in connection with the getting up of skins for market. It is advisable to skin the sheep almost immediately after it is killed and to completely strip the carcass, because every extra pound of wool increases the value of the skin. After skinning, the skin should be hung over a rail under cover. The man who skins the sheep carelessly throws the pelts over a fence rail in the sun, leaves it there until he thinks he has a bale and then sends them into the market, is the man who will tell you that it does not pay to save the pelts (Secretary, R. E. Hasting.)

THE FARM HORSE.

The following paper entitled "Management of Farm Horses" was read at a meeting of the Laura Bay Branch on 11th June, by Mr. A. M. Dixon:—

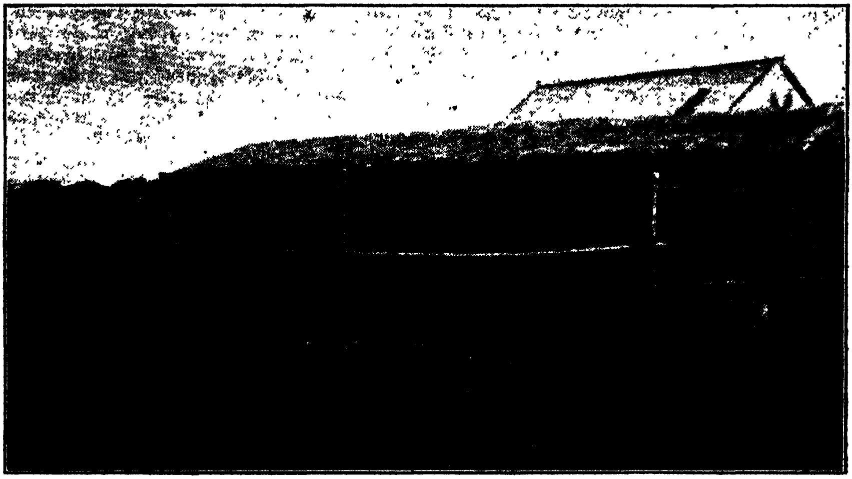
For general farm work the upstanding medium sized active animal with lightly haired legs has no superior. Too much hair on the legs is a disadvantage, when the barley grass goes to seed, because the seeds become matted in the hair around the fetlocks, which is very uncomfortable for the horse, and if not attended is likely to cause trouble

Feeding.—This is the great important item of horse management, and the farmer must use his own discretion to a great extent. The mangers should not be filled and then left until empty before another refill. The horse should receive at each feed just sufficient fodder. Under natural conditions the horse is a bulky feeder, and under working conditions bulk is essential to his feed. Even where concentrated feeding is resorted to, the admixture of chaff prevents over-hasty feeding and promotes digestion. Breakfast should be a small feed, as the horse would not be very hungry. Dinner should be the richest feed of the day, because a horse is usually given only an hour to eat, and the time for digestion is short. The bulk of the feed can be given in the evening, because there is plenty of time for the horse to eat, and no work to follow. Oats rank as one of the best grains for horses. They combine all the elements necessary for nutrition in such proportions that the animal is able to consume a large amount without upsetting the digestion and to extract the greatest possible amount of nourishment from it. Oats have been found to be the finest feed for horses of speed and for those in very hard work. It probably comes nearer the requirements of a concentrate for horses than any other grain. Horses will eat oats in preference to all other grain. Oats may be fed whole or crushed

Watering.—"Water first, feed afterwards" should be the general rule because a horse's stomach is small and water passes directly through the small bowel into the larger one carrying masses of undigested matter with it. However, it is not alway convenient or possible to water before feeding, and the horse very often has a mind of its own. Therefore if some little time elapses between feeding and watering, the horse should not suffer any ill effects. The question also arises whether a horse should drink when hot. It will not hurt him if he is used to it, and on the farm the walk in from the paddock will in most cases cool him down sufficiently. Should any particular horse be inclined to drink too heavily or to be griped in consequence his trouble will cease if the bit is left in his mouth while drinking, because it prevents him from taking too much.

Grooming.—The working horse if in hard condition, cleans himself to a great extent by sweating, and a roll before returning to the stable removes most of the dirt However, in the morning he should be thoroughly groomed. The secret of the art of grooming as an aid to condition is to carry it out with speed. After a long spell the horses shoulders should be washed with cold water immediately the collar is removed. This will harden the shoulders and prevent sores As an aid to hardening or toughening the skin of the shoulders of young horses, these parts can be swabbed daily with a strong solution of salt and water, or an extract made by the boiling of wattle bark. If they are brought to work gradually there should be no trouble with sore shoulders. The shoulders where the collar sits should be kept clean and free from dried sweat and grime, which are likely to set up chafing of the skin. The lining and stuffing of the collar should be kept clean by regular attention and kept soft instead of being allowed to become caked and hard with sweat and dirt.

Every horse requires his own collar, which should be carefully and properly fitted to him and any necessary adjustment made from time to time as the horse loses or gains condition. The collar should fit sufficiently close to enable it to lie quite flat and bear evenly on both shoulders. The collar must be short enough in length to prevent undue rising, but not so short that it will press the windpipe. The test is that the hand and wrist must be able to pass easily between the throat of the collar and the neck of the horse. New collars are a frequent source of sore shoulders. Be sure they fit, and see that the horse is given easy work until the collar is moulded to the shape of the shoulders. (Secretary, P. S. Morrison.)



Stables on Mr. Rodda's Farm at Cunliffe.

HORSE BREEDING.

In the course of a paper entitled "Horse Breeding", read at a meeting of the Nantawarra Branch, Mr. C. H. Belling stated:—"It is necessary for those who are breeding horses for sale to pay attention to the type of horse they are breeding from. After selecting the best mares on the farm, choose a good stallion; do not breed from a mongrel. It is just as easy to breed a good class of horse as it is to breed a poor one. A station horse might work as well as a good one, but he will not look as well in a team. Again, the medium horse will not command nearly the same price as would a good type horse in the sale ring. The farmer who does not keep a stallion, and who patronises a travelling horse, should look well into the pedigree of each horse in his district. The Clydesdale type of horse is preferable for farm work. They usually prove to be good workers, combining strength with pace, and are good tempered, while the mares are good mothers.

Care of the Foal.—When the foal is born catch it and paint the navel with iodine, repeating this for a day or so until the navel is dried up. This will often prevent 'navel-ill.' See that the mare is all right, and has plenty of milk. Feed the mare on chaff and plenty of bran. This will allow her to produce milk, and will keep her open. At the same time let her run in a paddock of good green feed. If the foal refuses to suck, an enema may be necessary. Before doing this apply a little olive oil into the anus with a finger. This often gives relief to the foal and saves straining. Foals should be weaned when five months old, and if necessary they may be kept in a small paddock. The mare should not be forgotten. The day the foal is weaned the mare should still be fed on hard feed. If one has a team working it would not hurt the mare to work. This will help to dry her off. Should the udder become hard and swollen, rub it with olive oil and lard. Foals should be bred in July and August; this will allow them to get plenty of greenfeed, they will shed their coats earlier, and usually look better than a late foal. Castrating should be done in the spring when foals are about 14 months old. It is advisable to obtain the services of a veterinary surgeon. Young horses can be broken in when at the age of 2 years by giving them a few short yokes in the cultivator. This will enable the shoulders to harden. At 3 years old they will stand work much better, and it will give them more time to grow into bigger horses. If a horse is not worked too hard when it is young it will give a longer service, and will sell much more easily. (Secretary, Mervin P. Hamdorf.)

DOES IT PAY TO REAR HEIFER CALVES AND TO BREED PIGS ?

The above was the subject of a paper by Mr. H. J. Hunter at a meeting of the Hope Forest Branch on 2nd September. He stated that if heifer calves were to be reared in order to increase the herd, only the calves from the bigger producers should be kept. If a cow which was a fairly good producer was mated with a bull known to come from a line of heavy producers, a heifer calf would usually turn out to be at least as good as her dam. On the other hand a heifer calf from an indifferent producer should not be kept if it was desired to raise the standard of the herd. If such a calf turned out a good producer her progeny would probably revert to poor producers, unless great care was taken to breed only from good bulls. It would take a long time to build up a big producing herd by rearing heifers from cows which were not worth their place in the herd. All successful dairymen had built up their herds by culling their poorer cows and only keeping heifer calves from cows that paid their way. It was useless to attempt rearing heifers unless cows were mated with a first-class bull. It would scarcely pay to keep them to sell on the market as calves, because they would have to be fed on whole-milk or some other substitute. In rearing a calf from an indifferent cow it should be remembered that the skim milk might otherwise be used for feeding pigs. The value of skim milk as pig food was about 2d. per gallon; a calf would consume 2galls. per day for 4 months. At the present price of pigs a profit of £3 could be made by using as pig feed the amount of milk consumed by one calf, although a certain amount of greenfeed was also needed. A calf of 4 months old therefore cost £3 in feed, and for the next 18 months it ate feed that could be eaten by a producing cow. A cow producing 6lbs. of butterfat per week at 9d. per pound for 9 months would bring in approximately £8. Such a cow could be bought for £5, and therefore showed a profit of £3 in addition to £3 from the pigs that might be sold after being fed on the skim milk.

Pig Breeding.—Sows recommended were Berkshire or Mid-York, which could be mated with either the Large White or Tamworth boar, either cross giving the ideal pig required by butchers and bacon curers. Pigs put on the market as weaners at 8 weeks old were the most profitable. They realised 12s. to 15s. The average sow would farrow a litter of 9 pigs, which would give an income of approximately £6 twice a year. Practically the only expense in putting the pigs on the market would be about 9s. for a bag of pollard. The sow would require about 1½galls. of skim milk per day and as much Chou Moellier or green clover as she could consume while she was dry in between litters, and the pollard would be used in helping her to suckle the young pigs. When the young pigs were 3 weeks old they would drink skim milk and eat greenfeed. The grazing paddocks should be small until the pigs were about 5 weeks old, when they could be turned into larger paddocks. Where there were a good many cows 1 sow could be kept to every 2 cows. All the weaners should not be put on the market at once; some should be kept to consume the skim milk, because one sow would not be able to consume all the skim milk from 2 cows. It was assumed that grazing or other green fodder was available; otherwise it was questionable whether skim milk alone would be profitable. At 8 weeks old pigs would be worth about 13s. 6d. each, while if they were kept a further 8 weeks they were worth about £1, a gain of only 6s. 6d. for the second 8 weeks feeding. A well grown 16 weeks old pig would double his weight in the next 8 weeks and should then be worth at least £2, a gain of £1. Against the £1 would have to be debited about 6s. for barley or wheat to put the pig into condition for bacon, otherwise the fat would be too soft and the price would be lower. Very little was gained in rearing pigs to small porkers. It cost only 14s. more to keep them until they were suitable for bacon. It would be preferable to obtain a further 2 sows to have 1 farrow about every 8 weeks, so that little pigs would be available to consume the milk regularly. It appeared that pigs should either be sold as weaners or kept until they were baconers. (Secretary, H. J. Hunter.)

THE HOME GARDEN.

Paper read by Mr. A. M. Twartz at a meeting of the Sutherlands Branch on 12th September:—*Soil.*—If the surface soil is not as desired it should be removed to a depth of 18in. and a sandy loam carted in. The area of the garden should be large enough to allow hedges to be planted. The fence should be 5ft. high and netted. For a hedge almonds should be planted, preferably Brandis or I.X.L., because these grow upright. Almonds grow in any soil, shed their leaves in winter, and are a profitable hedge. If the roots become troublesome they should be cut by digging a trench 3ft. deep every three years. The trench should not be left open as this causes the roots to travel around. The paths should be higher than the beds. *Water.*—A reliable water supply is absolutely necessary. To rely on the natural rains will not suffice. Overhead watering with a sprinkler is one of the best methods when the plants are small. Trees should be watered around the stem. *Manure.*—Sheep manure would be preferable to any other, cow manure next best. If the manure is lying around it should be heaped up after 15 to 20 points of rain have fallen. This method tends to kill weed seeds. Liquid manure can be made by filling a kerosene tin half full of manure and filling it with water. The liquid should be the colour of weak tea. Superphosphate can be used with success at the rate of one-third of an ounce per square yard. Farmyard manure or sheep manure should be dug into the soil before planting. When the plants need a stimulant, manure can also be placed between the rows. This method also checks weeds. *Plants and Seeds.*—A good plan is to follow Yates's garden calendar or Hackett's "Reminder." It is necessary to sow a bed of your favourite dish each month so as to have a continuous supply throughout the year. A bed of rhubarb should be in every garden. It comes in when other fruit is scarce. Cabbages, cauliflowers, carrots, lettuce, peas, onions, and shallots can be grown without expert knowledge. The home garden is not complete without flowers. A few fruit trees of apple, pear, apricot, nectarine, peach and fig will provide useful fruits for the housewife. A careful watch must be kept for slugs and snails. A good mixture can be made from Paris green and bran sprinkled between the plants. *Cultivation.*—By the frequent use of the hoe and plough weeds are destroyed and the surface kept loose. It is best to prepare the bed some time before planting. When a bed has grown a root crop put in a leaf crop next. *Points from Discussion.*—Black leaf 40 was regarded as the best spray for red spiders, and Paris green for slugs. Ashes were good for tomatoes if dug in when fresh. If not used at once they should be bagged up and put away in a shed. Yorkshire Hero was the best pea locally; beans were also easily grown. A lemon or orange tree should be grown; all the water from the house can be given it, including soapy water. Best place for melons was where a creek ran out, or in some sandy place. Tomatoes should be trained and pruned, and kept up with bamboo sticks. Brown skin onions were the best if they were to be kept indefinitely. Short carrots and bush marrows were also regarded as the best varieties. Cauliflowers should be sown with protection, planted in the evening, and covered with tins for a few days. They should receive a light watering regularly, and they would be ready in about six months. Sheep droppings were considered to be best for sandy loam, although one member preferred leaf mould. Watering tomatoes overhead was regarded as unwise by some. Ashes put around the stem of a tree would prevent ants from eating the fruit. Dahlias should not be watered too much, but it should be done regularly. They should not be allowed to grow higher than 2½ft. (Secretary, L. B. Doecke.)

POINTS ON THE CARE AND OPERATION OF FARM STATIONARY ENGINES.

The following paper was read by Mr. A. J. Pengilly at a recent meeting of the Alawoona Branch:—Nearly all farmers have need of some form of supply of power for belt work. Chaffcutters, crushers, &c., all require the use of some class of engine to supply the power to drive them. The makes and types of engines used vary considerably, but few of them exceed the 20 b.h.p. rating, and are generally, therefore, classed as light stationary engines.

They also fall into another classification, viz., petrol engines, spark ignition, petrol-kerosene engines, compression-ignition kerosene engines, and Diesel types using crude oil as fuel. The aim of this paper is to deal with the operation and some points on the care of each type. Stationary petrol engines are generally small engines of a low b.h.p., of both air and water-cooled types. Of these the predominating type for small engines up to 4 h.p. is "hopper cooled," meaning that the excess heat generated in the cylinder is dissipated by a hopper of water which completely surrounds it. An erroneous idea with which I have come in contact is that one need not be particular about cleanliness of the cooling water. With this type of engine one needs to be more particular than with any other, for boiling takes place more often during their operation. A deposit of only 1/16th inch will seriously interfere with the proper cooling of the cylinder, and will result in rapid overheating. Overheating in its turn brings about trouble due to the rapid breaking down of the old film in the cylinder, resulting in worn pistons, cylinders, and rings, or possibly scored and burned pistons and cylinders.

When the manufacturer builds the engine he delivers it to the customer in most cases with all adjustments made, to enable the engine to run and work as he designed it. A common error is made by owners in tampering unnecessarily with the factory settings. This particularly refers to the governed speed. Although this is adjustable in nearly all engines, the speed set by the maker will give the best service. Racing an engine results in rapid deterioration of working parts, particularly bearings and journals. If it is necessary to race an engine to make it do a certain job, either it is in urgent need of overhaul or is not powerful enough to do the work required of it. The only exception to the rule against interference with the governor setting may be to enable the engine to idle satisfactorily with a very light load. However, this may generally be accomplished by careful adjustment of the throttle control. Valve adjustments should be checked at frequent intervals, for too great a tappet or rocker clearance results in imperfect scavenging of the burnt gases, as well as a weak explosion, due to insufficient space for the entrance of the full charge. Insufficient clearance results in the valves not closing properly, and leads to burnt valves and pitted valves and seatings; also sticking valves and worn guides may result, due to destruction of the lubricating film on these parts. The ignition on petrol engines is invariably of the spark type. The high tension current is supplied either by a strip sparking device or a magneto. In either case the structure of these units is delicate, and therefore costly. Oil and grease on damp and dust naturally interfere with the operation of these units, and do serious damage to the insulation of windings and cables. The continued entrance of oil and dirt will often result in burnt-out armatures and windings. Therefore the magneto or other device should be kept scrupulously clean and protected from all sources of dust and dirt. The best method is to have a dirt-proof cover to cover over the magneto completely. Magnetos should only be lubricated as specifically laid down by the manufacturers. Trouble in these units should only be rectified by a man who thoroughly understands them, and they should be treated with respect by the uninitiated. The magneto is the most valuable unit on an engine, costing anything from £5 to £30, so it is well worth taking care of. Spark plug cables should also be protected from dirt, especially oil, as it rots rubber insulation very rapidly. Spark plugs should be set to the gap set out by the maker in the engine instructions, usually a space of 1/32in. separating the two points. The porcelains shoud be kept clean to avoid short circuiting, and all connections should be clean, strong, and definite.

One comes now to the subject of lubrication. Although so much emphasis is placed on it by manufacturers, practical men, and oil companies there is still a tendency to be careless in this respect. If an engine is worth the amount of money one pays for it, it deserves the best lubrication possible, and will then give its best service. There are good oils and there are lots of things resembling them but *not* just as good. Although the major oil companies charge high prices for their commodities, they sell good quality products which can be depended on, and good oil is cheap in the long run, as any "big-power" user will tell you.

Repairing small petrol engines, replacements of bearings, &c., are not very difficult to carry out if due care is taken. When removing parts, put them aside and mark them, or place them so that you will be able to recognise their positions when you want to re-assemble them. Most of this work is simple enough if one takes a reasonable amount of care. Do not be frightened that things will not go into their positions again. When cylinders, pistons, and rings become worn, resulting in loss of compression, new rings will often remedy the trouble until a rebore becomes necessary. Rings are supplied generally in four standard oversizes, viz., .001in., .003in., .005in., and .01in., and usually one of these sizes will make up for the loss of compression. The rings should be a good fit in the grooves, and when fitted squarely in the cylinder there should be a very small gap between the two ends. Rings are very brittle, and care should be exercised in fitting them to the piston. The best method to adopt is to slide the ring on over four thin metal strips, and then, withdrawing the strips, let the ring fall into its correct groove. Grooves should be first cleaned of all carbon and burnt oil deposits.

The foregoing points refer also to larger petrol engines, though these generally have a water jacket for cooling, through which the water circulates on a thermo-syphon principle. As before stated the cooling water should be clean and free from grease and other impurities. A very effective cleanser for a corroded water jacket is a solution of common washing soda, 1lb. to each gallon of water. Let it circulate for a full day or so of work. It is then drained out, the system flushed with clean water, and then refilled with clean water.

The design of spark-ignition petrol-kerosene engines very closely follows ordinary petrol engines, except that they are fitted with an auxiliary tank for petrol, and have some two-way arrangement for supplying the petrol and kerosene to the carburettor or vapouriser. These engines are designed to start on petrol when cold, and when they have become warmed up, to switch over to kerosense for working. The main thing to guard against is the error of changing to kerosene before they are thoroughly warm. This has the effect of breaking down the lubricating film in the cylinder due to unvapourised kerosene entering it, with resultant rapid wear, and in the case of enclosed crankcase, splash-lubricated types, a dilution of the lubricating oil, which is then unable to stand up to its work and burns, resulting in rapid wear and heavy carbon deposits in combusion chambers and on piston heads. Since these engines are generally of a fast-moving type, the piston speed is anything up to 1,000ft. per minute, and the necessity for good, undiluted lubricating oil is self evident.

The next class is the kerosene compression-ignition class, which depends on heat generated within itself and stored in the combustion chamber. These engines are usually much heavier in construction than petrol and petrol-kerosene engines, and run at slower speed. Difficulty in starting these types is sometimes met with, but this is usually due to the engine not being heated enough by the lamp or else it is too hot, back-firing occurring in the latter case. Mechanical causes of hard starting may be due to loss of compression through worn cylinders, pistons, or rings, or worn injection gear, or injection gear out of adjustment. A useful hint which may be applied to these engines is to use commercial castor oil for cylinder lubrication. This gives a much better seal, and holds the compression better than a heavy mineral oil. Castor oil is really the ideal lubricating oil, as it resists heat better, and was very widely used for aeroplane lubrication during the World War. The rocker clearances should be adjusted to their correct spacings, as too much play results in noisy cam action. The journals of these engines are usually lubricated by either wick syphon lubricators or ring oilers, and a good quality of flowing oil should be used in these. The big end connecting-rod bearing is generally oil lubricated by a closed cup. The piston pin is usually lubricated by surplus oil from the piston. These engines are usually thermo-syphon cooled, and have a large cooling tank to provide a large supply of cool water. Care should be taken in some types to prevent the injector valve opening, due to suction. This is prevented by adjusting the tension on the spring. If this is not watched, the engine may get out of control or "bolt," the governor having no control in such an emergency, since most of the types of governor used on these engines work on the "hit-or-miss" principle.

Lastly we come to the class of engine operating on the Diesel principle, using crude oil as fuel. Very few of these engines are in the hands of farmers at present, as they are really only a recent development as a small power unit. For this reason I do not propose to deal with them at any length. They ignite their charge by heat generated by their very high compression (anything up to 800lbs. per square inch), and the fuel is injected under pressure during the power stroke, the piston compressing air only on the compression stroke. They are much more complicated than ordinary kerosene engines, but are much cheaper to run because of the low fuel cost.

Possibly some farmers have engines operating on the "two-stroke" principle, so I will endeavour to explain the difference between the "two-stroke" and "four-stroke" engines. In the "four-stroke" the cycle of operations for one complete power impulse is as follows:—On the outward stroke the inlet valve opens, and a mixture of fuel vapour and air is drawn in. On the return of the piston the inlet valve closes, and the charge is compressed, making it much more easy to ignite. Just before the piston reaches the back dead-centre the charge is ignited and explodes, and forces the piston violently outward on the power stroke. On the return of the piston the exhaust valve opens and the exhaust gases are forced from the cylinder in readiness for the repetition of the cycle of operations at the beginning of the next outward stroke.

In the "two-stroke" engine the piston acts as its own valves by covering and uncovering openings or "ports" in the cylinder walls. The crankcase is sealed, and a by-pass leads from it to the inlet port of the cylinder. The fuel vapour and air is drawn into the crankcase through a manifold and "no-return" valve by the partial vacuum created periodically by the piston as will be explained later. On the first outward stroke the downward movement of the piston creates a pressure on the gas in the crankcase. When almost at the end of its stroke, the inlet port is uncovered, and the compressed gas rushes into the cylinder. The returning piston now covers the ports, and the gas so trapped in the cylinder is compressed. It is then ignited and explodes, forcing the piston outwards until the exhaust port is uncovered, a little before the inlet port is uncovered. The burnt gases then start to escape, and as the piston progresses on its stroke it uncovers the inlet port, and, the fuel having been compressed by the outward movement of the piston, it rushes into the cylinder, and in doing so forces out the remainder of the exhaust charge. The piston returns as before, and traps some more fuel in the manner stated, and the cycle is repeated. As the piston goes back, however, it creates a partial vacuum in the sealed crankcase and draws, therefore, a further supply of fuel vapour into it in readiness for the next stroke the one-way valve.

"The "two-stroke" engine is suitable only for light work, speaking generally, and is only satisfactory at high speeds. They are wasteful of fuel, and if run at slow speeds have an uneven power output, and tend to operate as a "four-stroke." Their chief advantage is that there is a power stroke at every revolution of the crankshaft, instead of every second revolution as is the case of a "four-stroke" engine. The "four-stroke" is more definite in action, and gives a relatively steady power output over all speeds, and is more economical with its fuel.

The following are a few points which may be of use in setting up drives:—

1. To find the required diameter of a driven pulley if the speed required is known:—Divide the produce of diameter and revs./minute of the *driver* by the required number of revs./minute of the *driven*.

2. Four-ply cotton and canvas belting is equal to single thickness leather belting in strength, and so on.

3. To find the length required for an open belt:—To twice the distance between the shaft centres add 3¼ times half the sum of the pulley diameters. Crossed belt lengths may be *approximately* calculated by using 3⅜ in the foregoing formula.

4. To find the required width of single leather belt for a given horsepower to be transmitted:—Multiply the horspower by 33,000, and divide it by the velocity of the belt (ft./min.) plus the allowable effective pull per inch in width. For all practical purposes this may be taken as 35lbs. for single leather belt.

5. To find the horsepower of a belt:—Multiply the width in inches, the allowable pull and the speed, and divide by 33,000.

6. A double leather belt will need to be only seven-tenths as wide as a single leather belt for the same power, and conversely a double belt will transmit ten-sevenths more power than a single belt of the same width.

7. New leather belts will stretch from ¼in. to ½in. per foot of length. Rubber belts are said to stretch continuously, and cotton and canvas belts stretch very little. (Secretary, A. J. Pengilly.)

Inspecting Mr. Magor's Pastures at Myponga Bureau Field Day.

Making Silage on Mr. R. Magor's Property at Myponga.

NOXIOUS WEEDS.

Mr. E. Kleinig, in the course of a paper read at the meeting of the Koonunga Branch on 11th September, stated that legislation to deal with noxious plants was passed by Parliament more than 50 years ago. However, a visitor passing through portions of the district at present would not think that noxious weed legislation existed, especially in the grazing country, where he would see nothing but star thistles and artichokes—the artichoke, however, was a good fodder for sheep when it was dry. Star thistle was a tall, slender plant, not eaten by stock except when it was very young. Yellow cockspur resembled the Saffron thistle, but was much stronger in growth and was never eaten by stock. Cape Tulip was very poisonous, and difficult to eradicate, and it spread very rapidly. There has been complaints about it locally. Cape Tulip was often planted in gardens, from which it could escape and ruin good grazing land. The Bathurst Burr preferred warm, moist conditions, like the River Murray districts. There were a number of plants of it in the district, but as they were kept under control more easily than other weeds, they were not likely to spread so quickly. Boxthorn was a dangerous weed and should be watched. Because of its hardiness, it was one of the first plants used for hedges. There were not many in the district, although in places they could be seen for miles along the roadway, and great care should be taken to prevent them from getting out of control. The Boxthorn produced red berries, which were eaten by birds, and thus the seeds were distributed by them. Boxthorn grew very rapidly and soon took possession of any waste land. It could easily be replaced for hedges by some other plant which was not so troublesome.

In purchasing seed, it was important to see that it was free from foreign seeds, because once weed seeds germinated, eradication was often very difficult and might prove very expensive if it were not done at an early stage. Good cultivation, combined with heavy stocking would kill many bad weeds. Sodium chlorate was a very effective spray in checking weeds (not sodium chloride, which was common salt). Sodium chlorate cost 8d. to 9d. per lb., and was used at the rate of 1lb. to 1 gallon of water, and sprayed on the foliage with an ordinary spray-pump. (Secretary, H. Mibus.)

A Crop entered by Mr. B. Jaensch, of Woodchester, in the Southern Competition.

QUESTION BOX.

At a "Question Box" meeting of the Coonawarra Branch held on September 5th the following questions were dealt with:—*Question*: Correct method of mixing ingredients of Bordeaux mixture? *Reply*: Most members favoured adding the lime to the bluestone solution. *Question*: Quickest method of dissolving bluestone? *Reply*: Place bluestone in a calico bag and hang it on the edge of a tub of cold water. Members did not advise heating the water. *Question*: Most suitable manure to use on old apricot trees likely to carry a heavy crop? *Reply*: Sulphate of ammonia was suggested, but was considered to have detrimental effects over a number of years. For the district best results would be obtained from 45 per cent. superphosphate. *Question*: Spray for an orange tree affected with black scale. *Reply*: Members agreed on the use of red oil. (Secretary, J. M. Kain.)

A meeting of the Chapman Bore Branch held on 12th August took the form of a "Question Box." The following questions were dealt with:—*Question*: Best breed of cattle for milk production in the mallee? *Reply*: The Ayrshire was a hardy type and a good producer. The Jersey and Holstein were also favoured. The milking Shorthorn was useful because of the better value for slaughtering. *Question*: Most suitable ram to mate with Merino ewes for fat lamb production. *Reply*: Dorset Horn was favoured. *Question*: Best oat for feed purposes? *Reply*: Mulga was the leading variety; Early Kherson and Palestine were also good varieties. *Question*: Cure for horses rubbing off their hair. *Reply*: Irritation probably caused by parasites. Wash with water containing phenyle. *Question*: Does it pay to sow more than 45lbs. of wheat per acre? *Reply*: On new land 60lbs. per acre could be sown in order to provide as much straw as possible for burning. On fallow 45lbs. of graded seed was considered enough. *Question*: Should one commence putting in fence wires from the top or the bottom of the posts? *Reply*: If wires were put in from the top the strainer posts were not likely to give and cause the wires to slacken. *Question*: Easy method of pulling old posts. *Reply*: Loosen soil around the posts, and if a jack was not available, the posts could be pulled by using a wagon and team. *Question*: Best implement for fallowing, share plough or disc? *Reply*: The share plough was best for local conditions. *Question*: Is two-year fallow advisable? *Reply*: The benefit from two years' fallow would not be sufficient to pay for the extra work. *Question*: Best time to commence sowing wheat. *Reply*: New land should be commenced early in April, and the fallows should be completed not later than the middle of June, providing seasonable rains fell. *Question*: Best variety of oats for new land. *Reply*: Algerian oats gave a fair return, and provided a good crop of straw for a burn to kill shoots. *Question*: How to keep weevil out of wheat stored on the farm. *Reply*: Wheat stored in bulk was not so likely to be attacked as wheat stored in bags. Sprinkling sulphur between the bags and on the floor was recommended. *Question*: How to check sand drift? *Reply*: Sowing and topdressing pasture would tend to keep the soil bound by the roots of the plants. (Secretary, J. P. Krollig.)

The inaugural meeting of the Karte Branch was held on May 30th, followed by a social and dance on June 14th. The subject of the next meeting on July 10th was an address by Mr. R. L. Griffiths (District Agricultural Instructor), who dealt with the question of drift. On August 14th a "Question Box" meeting was held. The following were among the questions dealt with:—*Question*: Cheapest method of destroying rabbits. *Reply*: Poisoned oats laid on a trail. A mixture of 1oz. of strychnine to 14lbs. of wheat with brown sugar added was also recommended. *Question*: Best sideline for the district. *Reply*: Dairying and poultry were best while blocks were new, followed by sheep when fences were erected and feed was available. (Secretary, M. E. Small.)

Visitors at the Annual Field Day at Kybybolite Experimental Farm listening to an Address by Mr. H. B. Barlow (Chief Dairy Instructor) on Fodder Conservation.

HOME TANNING.

[The following paper was read by Mr. L. C. COLLETT at a meeting of the Currency Creek Branch on 19th August.]

In order to make one's own leather, or to tan or cure furred skins for rugs, mats, etc., one must be prepared for a fair amount of work.

Tanning a Hide for Leather.—Selection: Take particular care in selecting a hide to get one that is all the one colour, has no brands or bruises, and is skinned from the beast cleanly and is not cut or scored by the knife. A black hide is preferable because it is more even in thickness and makes stronger leather than a yellow or red one. Sell a patchy hide rather than tan it, because a patch on the skin means weak leather.

Preparing for the Tan.—Place the hide flesh side upwards on a smooth log and, with the aid of a sharp knife, remove every particle of fat and flesh adhering to it.

Next place about four to six pounds of lime in a tin and add water to half fill the vessel. Stir well, put the skin in this, and in about four days the hair will rub off easily.

A shovelful of ashes mixed with the lime will usually stop the lime from working too severely on the hide and burning it.

When the hair is all off the skin, give the inside a good rubbing with a brick, or a piece of sandstone to take off any flesh that may have been left on in the process of fleshing.

The skin will now be pink and will contain lime. If this lime is left in, the finished leather will be brittle.

To remove the lime from the hide, mix up a shovelful of fowl manure in a half kerosene tin of water and steep the hide for three or four days. The lime will be out of the hide when the latter is again white. Wash the hide in clean water after removal from the bucket and before placing it in the tan.

Preparing the tan is not so complicated: Take a kerosene tin of crushed wattle bark and water and boil it until the tin is only half full. Add fresh bark and more water to the old and re-boil for another half hour.

Pour this mixture into the tan tub and add clear water until the tan is the colour of weak tea. Allow it to cool and place in it the clean hide. Turn the hide every few days, and after about six weeks it should be ready for the first examination.

When examining the hide make sure the neck, *i.e.*, the thickest part of the hide, is tanned completely through. If not, a green line will be seen in the centre of the cut you make, and a fortnight or so more will be required before the tanning is complete.

Finishing the hide is simple—Take it out of the tan and oil it, either on the outside or on the inside, with neatsfoot oil, mutton fat, or any other animal fat. Allow it to dry, either hanging over a rail or pegged out on a big board, such as a barn floor. If you want a particularly good job made of it, before oiling place it on a smooth board that will not let any air through and rub the hide either outside or inside with a smooth piece of wood. I use a round stick about 1½ins. in thickness. and 2ft. long. Do not allow the stick to turn in your hand but hold it rigid and rub it over the hide under pressure.

Polishing is an easy matter. Take the dried products and damp a piece at a time, rubbing the dampened piece in the same manner as when smoothing, until it is highly polished.

Making Greenhide, Using Skim-Milk and Soap.—Peg a fresh hide in the shade to dry for a few hours. When nearly dry dampen it thoroughly with skim-milk and brush it well with a stiff brush. Apply the milk daily for 10 days, not allowing any part to become dry. Now rub into it a bar of common soap until the whole bar is used, a process extending over several days.

Curing a Cowhide, White.—Remove the hair as before. Dissolve 3lbs. alum, 1½lbs. salt, and half pint of washing soda in hot water. Add 2galls. of water and soak the hide for a week. Dry in the shade, stretching whilst drying.

Furred Skins.—To tan a number of skins with wattle bark, clean the skins of fat and flesh and immerse them in the tan for a fortnight, changing the tan at the end of the first week. Work the skins whilst they are dry and sandpaper the inside.

Curing Skins for Rugs.—Dissolve separately ¼lb. salt, ¼lb. alum, ½oz. borax in hot water and mix solutions. Add enough bran to make a paste and spread it on the flesh side of the skins, rubbing it well in. Repeat the process for a week. Wash the skins well and rub whilst drying to soften them.

Curing Furred Skins White.—Pour 5 quarts of boiling water over 2 quarts of bran and strain the mixture. Make an equal quantity of blood-warm water saturated with salt. Mix the two solutions and add 1oz. of sulphuric acid to each gallon. Immerse the skins in the mixture and stir for 20 minutes. Rinse in clean water and stretch and pull whilst drying. (Secretary, D. Jeff-Gordon.)

PIG RAISING.

In a paper read at a meeting of the Brownlow Branch on 14th August, Mr. G. H. Roocke stated that sows in pig did not need much looking after. A small quantity of grain, a supply of water, and a little greenfeed was sufficient until farrowing time. It was an advantage to have the pigs in a large run sown with barley or oats. The only additional feed needed by mature sows would be a ration of ¾ pint of grain, although young sows would need more feed to ensure that their growth was not checked. Small pigs being fed for market should receive as much grain as they would eat, as well as plenty of skim milk. A clean run was essential. Pigs of the right type, if fed well, should be baconers at the age of 5 or 6 months. If the pigs were fed on grain it should be soaked for at least 12 hours before feeding. Best results were obtained from crushed grain, but profits were not large enough to pay the expense of the crushing. Grain should not be boiled, because boiling removed a great amount of its food value. In feeding old sows and hogs with grain, a fair amount of chaff could be mixed with the grain in order to fill them up. A sow for breeding should be of good shape and length and should have at least 12 teats in case she had a large litter. If a young sow had a large litter she should be kept for breeding, because in all probability she would continue to have big litters. A big litter of from 8 to 10 pigs could be reared quite comfortably by one sow. The most popular breed for the present-day market was the Large White crossed with the Berkshire. When breeding the above cross the Large White boar should be pure-bred, because the piglet from a Large White would always be white, whatever the colour of the sow. The Duroc Jersey and Tamworth were good breeds to cross with the Berkshire. The Duroc Jersey was very hardy and would thrive on much less feed than would other breeds. *Housing.*—The farrowing pen should be about 17ft. by 12ft. with a farrowing rail 6ins. high and 6ins. from the wall. The pen should be warm and free from draughts and should be provided with a bedding of short straw or cocky chaff. Long straw should not be used, because the little pigs were likely to get underneath it and be crushed to death by the sow. Weaning should take place at from 6 to 8 weeks. At 3 to 4 weeks the piglets would commence to eat by themselves and should be allowed to go out of the pen through a slip hole to feed so that the sow could not eat their food. Boar pigs should be castrated at about 4 weeks of age. (Secretary, A. R. Steinborner.)

MARKET GARDENING.

The following paper was read by Mr. L. Neighbour at a meeting of the Carey's Gully Branch held on 5th August:—We have many problems to overcome in the production of fruit and vegetables for market, but our greatest problem is to dispose of our produce at a profit. We cannot expect to make any great change in our present system of marketing nor entirely eliminate its faults, and the only thing left for us to do is to make the best of it.

The market is composed of a large number of individual growers, to a large extent in competition with each other. There is a little co-operation among a section of growers who endeavour to stabilise prices of a few lines to a certain extent, but their efforts are only partly successful owing to the large number of growers who will not come into line with them. It is almost impossible to get every individual grower to take an intelligent view of the situation, which would result in a definite all-round improvement.

Individual growers can get the best results under present conditions by paying attention to quality, preparation for market, and continuity of supplies. Quality of produce will give ready sale at possibly a price slightly in advance of general market rates, but quality itself is not sufficient to enhance sales and prices unless the produce is attractively prepared for market. Inferior produce should be eliminated as far as possible by the grower who wishes to obtain the best price for his produce. If all growers would do this the market would never be over-supplied. The demand would be increased if the best quality was always obtainable by the consumers. The grower should also endeavour to have a regular supply throughout the season, as by doing this he can keep his customers together and need have very little to sell in the open market. He should also endeavour to select his customers according to the value of their services to him. I regard the retailers as salesmen whose duty it is to sell any products to the consumers in the best possible condition and at the best possible price. The retailer who is willing to pay a little better than average market price for a better quality article is worth looking after, and is perhaps not such a rarity as it would appear.

Growers would often obtain better prices by the exercise of a little will-power, but too many follow the line of least resistance and give in to the other fellow's "won't power." Often a grower who finds it difficult to sell his produce at the ruling market rates, probably owing to its being of inferior quality or otherwise through having an over-supply, will reduce his prices and cause a general decline in market prices. This could be avoided by either discarding anything but the best quality, or in the event of having over-supplies of good quality produce, by realising that it is better to lose some of the produce at home than to take it to market and obtain less money for more work.

When the market is over-supplied I consider that it is a mistake to reduce prices, as this does not appreciably increase sales. Growers generally should be advised to reduce the quantity they bring to market, a general meeting to be called for this purpose if necessary.

Genuine distributors would welcome action on these lines, as it would tend to eliminate the cheapjack, who is a menace to the industry generally. An improvement might be made by having a definite closing time for business in the market. Most of the cheapjack business is done after the better class retailers have obtained their supplies and departed on their rounds. A definite closing-time would force the cheapjacks to compete with the genuine retailers on an equal footing. It might be objected that some growers would sacrifice their produce as closing time approached, but I think that the idea is at least worth a trial. (Secretary, F. W. Sharp.)

LONE GUM AND MONASH.

At a recent meeting of the Monash Agricultural Bureau, the principal speakers were Messrs. N. Fotheringham (Manager, Government Orchard, Berri) and F. R. Arndt (District Horticultural Instructor).

Mr. Fotheringham dealt with the practice of "tipping" the vines, mainly sultanas. He said the object of "tipping" was mostly to control the luxuriant growth by tipping off the ends of the shoots and encouraging the lateral growth, with the exception of the central shoots, which were to be the canes for the next year. Central shoots should be tipped when of sufficient length to lay down for the following year. Tests were being carried out at the Government Orchard in connection with "tipping." Up to date it had been noted that on identical rows "tipped" and "untipped" vines had shown 4,400lbs. dried to the acre and 3,900lbs. respectively. Only strong vines, of course, should be treated. It was apparent from observations that "topped' vines were at a disadvantage when it came to drying, the check reflecting back on the fruit, so that the "topped" vines dried off lighter than the fruit from the "untopped." In cincturing the currants, the best results had been obtained by means of the double knife-cut at the time when the caps were falling freely. Mr. Fotheringham recommended putting a strip of wax bandage around the cincture. This allowed the fruit to set, and healed the cut up quickly. Tests with cincturing the sultana had shown that it improved the yield, but the fruit itself was not good for dipping, and so the practice could not be recommended by him for sultanas.

Mr. Arndt spoke of spraying practices. Very little disease had shown up this season. With currants, oidium had to be contended with, and it was always essential to treat for this. Sulphur blown on to the vines was effective, but quite a lot were now using colloidal sulphur, which was mixed with water, 2lbs. to 100galls., and sprayed on to the vines. There was slight oidium with the Gordo vine, and this year especially there had been a great deal of erinose showing up. Sulphur was the cure for this. Black smut was very bad this year, especially on the late Valencia oranges. It was essential that this should be checked, and it was due to the black scale. Besides the damage to the tree, black smut on the fruit meant that it had to be washed, with the consequent extra cost in handling. Trees should be sprayed with white oil at the end of January or early in February to check the brood at that time.

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
SOUTH-EASTERN DISTRICT.				
Wolseley	14/10/35	7	Congress Delegates' Report	E. W. Sharrad
Mount Gambier	11/10/35	10	Congress Delegates' Report	J. E. Morphett
Mount Gambier	15/11/35	9	Address—E. W. Tollner..	J. E. Morphett
Tantanoola	2/11/35	6	"Handy Hints on the Farm"	L. J. C. Osborne
Rendelsham ...	13/11/35	7	Address—C. A. Goddard	F. Todd, jun.
Allandale East .	6/12/35	11	"Post Splitting"—T. H. Earl	R. T. Laslett
Rendelsham ...	5/12/35	6	"The Plant and its Food" E. Sly	F. Todd, jun.
UPPER NORTH DISTRICT.				
Appila-Yarrowie	1/11/35	14	"Trip to Central Australia"—W. E. Lange	E. H. Wurst
Eurelia	6/11/35	6	Congress Delegates' Report	E. P. Wall
Baroota........	11/11/35	15	"Most Suitable Fodder for Early Feed"—C. R. Mudge	E. W. Hulster
Wilmington	19/11/35	15	"Binder and Harvester Adjustments"—E. H. Hampel	P. C. Cole
Baroota........	9/12/35	12	"Care of Machinery"—W. A. MacDougall	E. W. Hulster
MID-NORTH DISTRICT.				
Gladstone	1/11/35	—	Formal business	Max Hoare
Mount Bryan ..	9/11/35	8	Congress Delegates' Report	A. A. Jefferies
Hilltown	5/11/35	16	Question Box	L. J. Harvey
LOWER NORTH DISTRICT.				
Stockport	22/10/35	100	Address—W. J. Spafford.	R. V. Koch
Greenock	21/10/35	22	Field Day. Address—W. C. Johnston	A. Schubert
Brownlow	11/9/35	10	Question Box	A. R. Steinborner
Brownlow	9/10/35	11	"Bulk Handling of Wheat", F. Woithe	A. R. Steinborner
	19/10/35	—	Break-up Social	A. R. Steinborner
Rosedale	5/11/35	14	Social. Results of Crop Competition	W. George
Williamstown...	15/11/35	7	Address—H. J. Apps ...	W. R. Parmenter
Koonunga......	4/12/35	16	"Preparing a Goose for Christmas"—H. Schrapel	H. Mibus
Springton	28/10/35	—	Trip to Roseworthy College	E. Brokate
Springton	22/11/35	6	Discussion	E. Brokate
Light's Pass ...	11/11/35	21	"Pruning Competitions" F. W. and Bert Boehm	C. A. Verrall
Truro..........	18/11/35	11	Formal business	L. S. Davis
Koonunga......	6/11/35	13	Question Box	H. Mibus
Hanson	5/11/35	25	"The Law and the Landholder"—F. L. Worth	M. de N. Lucas
Upper Wakefield	10/10/35	65	Social	H. W. Gregor
Upper Wakefield	7/11/35	8	Annual Meeting	H. W. Gregor
Light's Pass ...	9/12/35	24	"Disposal of the Apricot Crop"—F. W. Ahrens .	C. A. Verrall

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
YORKE PENINSULA DISTRICT.				
South Kilkerran	31/10/35	—	Address—W. J. Spafford	R. E. Hasting
Bute	25/11/35	8	Discussion	R. W. Langman
WESTERN DISTRICT.				
Miltalie	29/10/35	10	" A Trip to Fiji "—H. R. Jacobs	Syd. D. Ramsey
Wallala	9/10/35	5	Congress Delegates' Report	C. F. Zippel
Green Patch ...	7/11/35	17	Discussion	C. J. Whillas
Maltee	7/11/35	12	Congress Delegates' Report	E. Schwarz
Balumbah......	12/11/35	11	Congress Delegates' Report	J. E. Swann
Ungarra	11/11/35	11	Congress Delegates' Report	W. G. Gordon
Green Patch ...	5/12/35	16	" Estimating Hay Yields "—C. J. Whillas	C. J. Whillas
Taragoro	7/11/35	7	Congress Delegates' Report	T. Winters
Mount Hope....	2/11/35	7	Field Day	J. L. Vigar
Pygery	19/11/35	8	" Mixed Farming "—A. R. Kammermann	A. Day
Laura Bay	12/11/35	12	Discussion	P. S. Morrison
EASTERN DISTRICT.				
Coonalpyn	6/11/35	33	" Cows as a Side Line "—F. F. Smedley	C. C. George
Lameroo	15/11/35	15	Exhibition of Weeds and Fodder Plants. Discussion	A. G. Potter
Devlin's Pound .	12/11/35	14	" Sheep *v.* Wheat "—A. G. Robertson	H. A. Loffler
Devlin's Pound .	4/12/35	13	Question Box	H. A. Loffler
SOUTH AND HILLS DISTRICT.				
Frayville	30/10/35	44	Crop Competition Results	H. H. Ramm
Ironbank	4/11/35	19	Reorganising Branch	C. M. Morgan
Scott's Bottom .	16/11/35	8	" Birds "—R. Thorpe....	E. L. Atkinson
Blackheath	14/11/35	9	Address—" Fertilisers "—F. G. Guster	E. H. Paech
Hope Forest ...	4/11/35	13	Congress Delegates' Report	H. J. Hunter
Cherry Gardens	9/11/35	150	Annual Social	A. R. Stone
Ironbank	5/12/35	14	Discussion	C. M. Morgan
Hartley	4/12/35	9	" What the Farmer should Produce for his Table "—A. B. Brook	W. J. Brook
Currency Creek .	14/10/35	10	Address—H. J. Apps ...	D. Jeff. Gordon
Currency Creek .	11/11/35	14	" Bird and Insect Friends of the Farmer "—Mr. Ward	D. Jeff. Gordon
Yundi	20/11/35	70	Field Day	T. R. Smart
Shoal Bay......	12/11/35	10	Discussion—" Clearing New Land "	E. B. Bell
Monarto South .	16/11/35	19	Lantern Lecture " Road Construction "—Mr. Abbott	C. F. Altmann
Longwood......	9/11/35	13	Homestead Meeting—Mr. Woolcock's, Scott's Crk.	H. G. Haines
Hope Forest ...	2/12/35	9	Question Box	H. J. Hunter
Cherry Gardens	14/12/35	15	Reunion Meeting	A. R. Stone
Blackheath	14/12/35	8	Paper from *Journal*	E. H. Paech

WOMEN'S BRANCHES.

SWEET CORN OR TABLE MAIZE.

[Paper by Mrs. E. B. FRANKLIN at a meeting of Karte Branch on 14th August.]

As spring is approaching one begins to think of the summer kitchen garden, fruits, salads, &c., and why not try a little sweet corn. Many of us country women have in the past missed much by not adding this delicious article of food to our kitchen garden list. There are quite a number of ways of using and cooking sweet corn. This one is delicious:—

Pick the cobs just as the tassel is drying off and put them into a saucepan containing boiling water. Add a pinch of salt and boil for about 20 minutes. Take up and serve as a vegetable, spread a little butter on and sprinkle pepper and salt on each cob. You require two forks to get the little grains off—the cob or centre. To take hold of the cob as daintily as possible in the fingers, much the way a small child does a slice of watermelon is indeed quite an easy way to eat it. It is also used as a salad and in salads. I think a little sugar could be added in the boiling as is done with green peas.

It is quite a change for desert with cream and sugar. It is a wonderful substitute on a day when meat is scarce or the weather is too hot to eat meat.

It makes a delicious sweet by roasting the grains in a close iron vessel until they pop, then they are taken out and dusted with powdered sugar, making "Pop Corn." There are a variety of kinds to choose from, Country Gentleman being a great favourite, but a little on the late side.

Sow from August to October, in highly manured soil in a row and a foot apart. Mulch with manure and water freely. (Secretary, Mrs. F. N. Atze.)

HOME GARDENING.

"Gardening as a Hobby in the Country" was the subject of this paper read by Sister Mudge at a meeting of the Snowtown Branch:—In most instances we are unable to choose the situation of our gardens but must make the best of what we have. The first and most essential thing to do is to provide a breakwind. If you have or can afford to have an iron fence erected surrounding your garden you are indeed fortunate. A good breakwind can be made by planting bamboos either in rows or in clumps. I find them very easily grown once they get a start. Trench the ground and manure well, give plenty of water for 2 or 3 weeks, or until they get a good hold. Once they are well established they require no water.

A hedge which is used a good deal and will grow with very little water and attention is Native Myrtle. If kept trimmed, it looks very green and fresh, but it is a robber. Wormwood may also be used and is really quite effective, but must be kept trimmed and tidy. There are less hardy ones such as the Cupresses, Coprosma, Kaffir Apple, etc.

A fence built of bamboos entwined between wires or bars, and with creepers or roses grown over it looks quite nice and effective, and small plants and bulbs may be grown right under it as it takes no nourishment from the soil. Morning Glory or Dolicos may be used with effect.

If your have water laid on, you will be able to grow much more and with very much less trouble and time. Much can be done with waste water and all water should be put into buckets or tubs to be used as wanted.

Such hardy flowers as Antirrhinums, Wallflowers, Gaillardias, Geraniums, etc., may be grown with this water, which otherwise would be wasted.

It is necessary to manure and prepare the ground, and afterwards keep the ground well worked up and loose. By giving them a good soaking once or twice a week much better results are obtained than by sprinkling the surface. This is best in all gardening.

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Drains, etc., from the kitchen or laundry may be used to advantage by planting Cannas where the water soaks in as these plants cannot get too much water. They keep the spot from becoming offensive and boggy, besides being a bright green spot nearly all the year. Use plenty of horse or cow manure, both of which can be easily procured on a farm.

Rockeries are very fashionable at present and can be built quite easily and quickly if you have some suitable stones handy. These may be built on a spot under trees or anywhere where it is difficult to grow flowers. If planted with Succulents, which grow quickly and easily and take very little water and attention, they are most effective. When building rockeries keep in mind the idea of hills and valleys and build your rockery accordingly. If you can arrange a small pool for fish or bird-bath and drinking pool so much the better. One or more lawns always look green, cool and fresh, and if a large area, they help to fill in the space. For these, tap water should be laid on. If water is scarce and you haven't the time to grow annuals, which need constant attention, shrubs are quite a good idea. Many quite hardy ones are obtainable, and I think we would be wise to go in for our own wild and native shrubs more. These are hardy and stand up to droughts one they become established.

Two or three shrubs planted annually enable one to work up quite a good show, and most folks have enough waste water to grow 2 or 3, as after the first year they take much less water. Give these a good soaking once a week to get good results. By this means in a few years you have quite a bright little spot without a lot of work.

If water is scarce one may have a very good show in the spring by planting such hardy annuals as Antirrhinums, Larkspurs, Hollyhocks, Shirley Poppies, Stocks, etc., and only keep some Geraniums and possibly some Sunflowers and a small bed of Petunias going in the summer, allowing the rest of the garden to lie idle until the following winter. A good plan too is to grow bulbs in the winter as the winter rains will give them all the water necessary. (Secretary, Mrs. A. Hocking.)

"Planning the Flower Garden" was the subject of the following paper by Mrs. S. Smith at a meeting of the Rendelsham Branch on 7th August:—

Gardening is one of the most pleasant and healthful hobbies that a busy housewife can possibly have. To spend an occasional half-hour or so on a pleasant sunny day among the flowers when one is weary of indoor work is most restful and soothing. A well-cared-for flower garden always gives a home-like atmosphere to a house, and one is well repaid for the work spent.

The rose is considered the queen of all flowers, and there are many beautiful new varieties of standards to be had. July is considered the correct month to prune roses, and if the prunings are planted in a trench and well watered for the first year some very nice rose bushes will be obtained.

The purple Iris is very popular for indoor decoration at this time of the year, when there are so few flowers to be had. Its correct name is Iris Stylosa, and it can be had in several shades. They do not flower the year following re-planting, but after that they bloom well, and one can always be sure of a dainty vase of flowers for the tables during the winter months.

Seeds of spring flowering annuals should be sown early in this climate. Pansy and Viola seed should be sown in January, in order to have strong plants ready to put out with the first rains, and they then make good growth while the weather is warm. My experience with seedlings is that it is quite useless to plant out while the ground is sodden and cold. They frequently damp off and die right away, whereas, if planted early, they may appear at a standstill during the winter months, but still they have a good root system, and with the appearance of the warmer spring days they go ahead rapidly.

Firstly, a garden should be carefully planned and laid out in shaped beds, bordered preferably with a neat design of flat stones, then small bordering plants, such as the popular Viola, Phlox, Virginian Stocks, Violets, Portulacca, &c.; in fact, any small, close-flowering plants which make an attractive setting for the larger flowers. A popular idea which gives a nice finish to a small garden is a herbaceous border, on either side of the lay-out of small beds. This is a long bed, planted firstly with small edging plants, then flowers a little larger, ranging up to the tall varieties, such as Foxgloves, Delphiniums, Hollyhocks, &c., as a background, and then behind this, if there is space to spare, several of the larger flowering shrubs may be planted. This gives a sheltered appearance to a garden, and there is usually a show of flowers, as a variety of shrubs are to be had which give a succession of blooms.

No garden is complete without a collection of bulbs. Even the humble yellow and white Jonquil brightens our flower beds during dull winter days, and they look most attractive if planted beneath trees and shrubs. The little Snowdrop is also a first favourite, and then we have Daffodils, Freesias (which have such a sweet perfume), Hyacinths of various colours, and others too numerous to mention. The Arum Lilies and Agapanthus also should have a place, as they look very stately and beautiful against a background of trees. To have a really beautiful and attractive flower garden, it is necessary to have a plentiful supply of water during the summer months. This, with care and attention during the winter months, such as hoeing cultivating and manuring, should ensure a beautiful flower garden that any home may be proud of. (Secretary, Mrs. W. Bignell.)

[Paper read by Mrs. OSWALD at a meeting of the Maltee Branch on 8th August.]

Flowers to be sown in January and February are Iceland poppies, Cinerarias, Pansies, Stocks, Lupins; also Gladioli bulbs to flower in autumn weather, and Violas are extremely showy as a border. Lupins provide a great quantity of flowers for cutting and should be sown in their permanent position as they do not transplant well.

When raising Iceland poppies choose a cool shady spot and keep the bed covered with hessian until the seeds have germinated.

March is the best time for Sweet Peas, for which the ground should be deeply dug and plenty of rotted manure used. Antirrhinums require a fairly dry, not over rich soil. Carnations like a gritty soil. This also is the month for spring flowering bulbs, such as Daffodils, Tulips, and Freesias.

In April flowers for spring blooming not already sown should be put in without delay. Seedlings previously raised should be planted out as soon as they are large enough. Choose dull weather, and wet the ground around the roots thoroughly before planting. This is an ideal month for planting roses, evergreen shrubs, strawberries, and Violets. The soil for Violets should not be too rich.

In May Cannas and Chrysanthemums may be lifted. Dahlias may be lifted also and kept in a dry place until spring. During June and July prune roses and fruit trees, Geraniums should be pruned to induce fresh growth, in order to make them flower freely. Winter pruning of roses should be completed during July, in other than cold districts. In heavy soil a dressing of lime will be of benefit. Well rotted stable manure can be forked into soil around trees and shrubs.

August and September.—Cannas thrive in heavy rich damp soil. Phlox should be divided if too thick. Liquid manures should be applied to Violas. Sow Mignonette seeds where it is to grow, as it does not transplant well. As Chrysanthemums throw up their new shoots break them off at the base and strike them in a warm, moist, sandy soil. These make better flowering plants than the old clumps.

Phlox are one of the finest bedding plants for coloured masses during summer months. For Geraniums choose a soil neither rich nor too moist, otherwise they do not flower freely.

Petunias, Portulacca, and Zinnias should be planted during October. Portulacca flowers well during the hottest weather, and is very attractive where grown along brick paths.

November and December:—French Marigolds flower well in the summer. Asters need a shady spot. Daffodil and Freesia bulbs may be lifted during these months as they die back. From this time onwards, early sowing of Stocks, Iceland Poppies and Pansies is frequently made.

Dahlias do well if planted at this season.

Most soil is improved by the addition of manure, and for most plants plenty of water is essential. (Secretary—Miss L. Bassham.)

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KNITTED SOCKS.

[Paper by Mrs. L. M. MARTIN read at a meeting of the Maltee Branch on 13th June.]

For knitting socks I always use either 3-ply or 4-ply Paton and Baldwin's Superfingering wool. I prefer the 3-ply as the socks are much softer and look better. Cast on 72 stitches, 24 on each needle, and knit in ribbing. Knit 1 purl 1 for 4ins., then knit 1½ins. in plain knitting, except 1 stitch for the back of leg which is purled right down to the heel. In next row start to shape the leg by knitting 2 stitches together either side of the purl at the back of the leg. Then knit 1¼ins. then decrease again in the same, knit 1in. and decrease, each time knitting less before decreasing until 12 stitches have been taken off, leaving 60. Knit ½in. plain, then start the heel. With 30 stitches on back needle and 15 on each of the others knit a double heel by slipping 1 stitch, knitting 1 stitch across the 30 stitches and purling back for 15 to 20 rows, according to length required. Then turn the heel. Slip 1, knit 18, slip 1, knit 1, pass the slipped stitch over, turn slip 1, purl 7, purl 2 together, turn; slip 1, knit 8, slip 1, knit 1, pass the slipped stitch over, turn; slip 1, purl 9, purl 2 together, turn; slip 1, knit 10, slip 1, knit 1, pass the slipped stitch over, turn; slip 1, purl 11, purl 2 together, turn; continue to work in this manner until 18 stitches are on the needle, then knit 16 or 17 stitches on the side of the heel, and across the 30 stitches on the instep. Knit the other 16 or 17 stitches on the other side of the heel, then knit 2 plain rows all around on the three needles. Next row commence shaping the foot. Knit down the first of the back needles to the last three stitches, slip 1, knit 1, pass the slipped stitch over, knit 1 then knit the 30 instep stitches, knit 1, slip 1, knit 1, pass the slipped stitch over, then knit on to the end of the needle plain. Knit 2 rounds plain then decrease again, in the same way. Then 2 rounds plain again. Continue this until you have 15 stitches on each back needle and 30 stitches on the front. Knit plain without decreasing the length you require for the foot. From the side of heel, measurements are:—6in. for a 10in. foot, 6½in. for a 10½in. foot, 7in. for a 11in. foot. To shape the toe:—First needle, knit plain to the last 3 stitches. Slip 1, knit 1, pass slipped stitch over. Knit 1. Front needle, knit 1, slip 1, knit 1, pass slipped stitch over. Knit to last 3 stitches. Slip 1, knit 1, pass slipped stitch over, knit 1; third needle, knit 1, slip 1, pass slipped stitch over, knit plain to end of needle; 2nd and 3rd rounds plain, then decrease in same way again and continue the decreasing thus until there are 6 stitches on each of the 2 back needles and 12 stiches on the front one. Put the back stiches on one needle so as to have the work on 2 needles, then break your wool about 12 inches from the work. Thread the wool to a darning needle and graft off as if for knitting, into the first stitch of the front needle. Draw it through and slip the latter off the needle. Insert the needle as if for purling into the second stitch of the front needle, draw the wool through and let the stitch remain on the needle, taking the wool under the front needle, and insert the darning needle as for purling into the first stitch of the back needle. Draw wool through this stitch and draw the latter off the needle. Inserting the wool needle as if for knitting into the second stitch on the back needle, draw the wool through and let the stitch remain on the needle. Bring the wool forward under the needle and repeat until all the stitches are worked off, darning in the end of the wool securely when finished. (Secretary, Miss L. Bassham.)

THE SOCIAL ASPECT OF FARM LIFE.

[Paper given by Mrs. N. J. CROSS on 4th July, 1935, at a meeting of the Boor's Plains Branch.]

Farmer's wives, or any women that live in the country enjoy very little social life in comparison to our city sisters, particularly since the depression. The difficult times we are passing through has affected the women on farms to a considerable extent.

In order to balance the budget one has to scheme in different ways. For instance, during the last few years many of the farm women have begun to bake their own bread, and to keep extra cows and poultry, which all means extra work, thereby leaving less time for pleasures, etc.

Although one always enjoys an outing or a social gathering of this kind, there seems very little time to devote to pleasures of any kind and often one feels too fatigued to make the effort to go out to a social gathering. We sometimes become too absorbed in our daily routine of work, so that we leave very little time to relax from the strain of our daily round and obtain any pleasure of the various ways wherewith to make out life on the farm brighter in the social way. With meetings of the Agricultural Bureau, ladies from the different districts can meet and discuss subjects that are of interest to all women, and as time goes on and we all become more confident in public speaking and are not so afraid of our own voices. The criticisms and discussions enable all members to enjoy these social gatherings.

Another social gathering I would suggest is an afternoon given in one's own home, where one can invite friends and entertain them with competitions and games, or failing that, the idea of coming together and enjoying a social chat with one's neighbours and friends over a cup of tea followed by a stroll around the garden or grounds always proves to be enjoyable and the pleasure derived from such an afternoon amply rewards one for any small effort that may have been made. An afternoon spent on the tennis court is always enjoyed by ladies and young girls and does not require much preparation. The women of to-day are inclined to overdo this preparation of afternoon tea; I would suggest a cup of tea with scones, small cakes, and perhaps a plain cake or so, as it seems unnecessary to tire oneself with a lot of cooking before friends arrive. Not being in doors during the afternoon the house will be sufficiently clean from the usual week end cleaning, therefore there is no need for any extra preparation in that way. This form of entertaining helps to keep one young and healthy, and the benefit derived from such exercise is of great value to one physically as well as socially.

One always enjoys an evening given in one's own home with just a few friends and some music and songs and elocutionary items if the friends happen to be talented in that way. It is also an opportunity for the children to perform in the presence of others, thereby being a great help to them later when they may be called to assist at a school concert or any other public function.

Table tennis or bagetelle always affords a good deal of pleasure to both old and young, followed by supper. Bridge afternoons and evenings are very popular too. Besides entertainments given in the home we must not forget the enjoyable evenings spent at social gatherings, not forgetting the Bureau social. In the summer we have the sea to call us to come and enjoy the cool breezes and the bathing.

Endeavour to make life on the farm as pleasant and attractive as possible, not only for ourselves, but also for young people, as life in the country is far different from the many pleasures the young people enjoy in the city, besides work being much harder for them. (Secretary, Miss L. Stanway.)

REARING OF TURKEYS.

[Paper read by Mrs. R. O. PHILLIS at a meeting of the Karte Branch on 14th August.]

Turkeys can be reared successfully in this district, but they need a lot of attention, especially in the feeding and housing or yards.

I started my first lot by putting 9 eggs under a Black Orpington fowl, and she hatched 7 chicks. I kept them isolated from all other fowls, which is one of the main points in rearing of young turkeys until they reach a certain age, which I call "red head" stage. Young turkeys should not be fed until they are 24 hours old. The first meal should consist of hard-boiled egg chopped very finely. As they grow older add a little chopped lucerne or lettuce. Some people advise onion, but it is better left out. When they are about a week or so old give them curdled milk and bran, but not

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pollard, as pollard binds them, and if this is not attended to when first noticed you are apt to lose all your batch of young birds. Crushed wheat is more digestible than whole wheat until they are six to eight weeks old.

Members of the recently formed Women's Branch at Karte.

Breeding.—To obtain good results you need only six hens for one gobbler; otherwise you will have too many infertile eggs. When the hens start laying let them keep their own nests until they go broody and they can then be moved to a suitable place without any trouble. A turkey egg takes a calendar month (30-31 days) to hatch. I have heard several people say the eggs were no good when the bird sat for just four weeks and they have thrown her off the nest by not knowing how long they should set. A turkey is better set out in the open where there is a good deal of dampness. They start to lay and sit from July to January. I have had them bring out a batch and when they are about 5 to 6 weeks old they are laying again. Change your gobbler every year. If keeping any of the young hens from last year's batch, never breed back, as it causes many losses. Obtain one if possible from another district. Turkeys do not need a shed, they are better roosting out in the open. Fresh air is a main point. Do not close them in a shed with fowls or other birds. Fowl lice and tick are very bad on turkeys, and will kill them very quickly. (Secretary, Mrs. F. N. Atze.)

BREAD-MAKING.

[Paper by Mrs. A. ADAMS, read at a meeting of the Boor's Plains Branch on 1st August.]

During the past few years incomes have lessened considerably, this being caused by the low prices received for our wheat and other things produced on the farm; and there are few of us who have not found it necessary to economise in every possible way, in order to help our men folk to meet the needs of the present time. Many women have decided to help by making their own bread, it being one of the most important food items that we need. It is very nice to have the baker call twice or three times a week, but when one thinks of the price we are asked to pay for a loaf of bread and the price we receive for our wheat, we realise that it is too great a difference and so we set about making our own bread. It costs very little to have our own wheat milled and we can get enough to last several months, which I think is the better plan as the older flour makes the best bread.

First of all we need a deep pan for mixing the bread in, and this pan is best if never washed; it can be scraped and then rubbed clean with a dry towel, the same applying to the tins in which the bread is baked. There are many different kinds of yeast, and many different methods of making yeast. I make hop-yeast in the following way:—Put a large pinch of hops into a jug and pour over them one pint of boiling water in which a potato has been boiled. When cold pour into a bottle and add 1 tablespoon of sugar and flour mixed together with a little cold water. Add a small pinch of cream of tartar, shake well, and leave in a warm place to work. It should be ready in four hours. This quantity will make four average size loaves and five sifters of flour will be needed. Sift the flour into the mixing pan and allow 1 teaspoon of salt to each sifter of flour. Warm the flour for a few minutes, then add yeast and sufficient luke-warm water to mix (do not have dough too stiff). Knead for a few minutes, cover well with a blanket and leave over night to rise. Next morning it should be ready to knead up again and shape into loaves. Put aside the loaves to rise again, and in about an hour they will be ready to bake.

I have been using compressed yeast about eight months now, and find it a much quicker method of bread making, as it does not need to be mixed over night. I think that the time saved in this way makes up for the little extra cost.

One ounce of compressed yeast will make four loaves of bread. Sift flour and put the salt in the bottom of the pan and then warm. Take the yeast and break up finely in a small basin with a fork, add about 1 cup of luke-warm water and mix well. Make a hole in the centre of the warm flour, pour in the yeast, leave about 20 minutes in a warm place so the yeast will work a little, sprinkle about 2 dessertspoons of sugar on the flour around the yeast being careful not to put any sugar in the yeast. Now proceed to mix the bread in the usual way as with hop yeast. This will not need so much kneading as the hop yeast bread.

Open the oven door and lay on it several thicknesses of paper. Put pan containing dough on this and cover with more paper; this will only take about 3 hours to rise, and if mixed after breakfast it will be baked by mid-day. If it is not convenient to set the dough on the oven door it can be put on a chair close to the stove, but it will take a little longer to rise.

An ounce of compressed yeast costs 3d. and will keep if kept in a cool place. Now there is not only the mixing of the bread and putting it in the tins, but like most other things it has to be baked, and the baking is a very important process. The oven should be hot—about the heat used for baking pastry—and 10 minutes after the bread is in the oven it should have a nice golden brown crust, and it should be cooked in an hour and a quarter. It is most important not to let the dough get cold at any time, as this will result in a poor quality loaf. A plate warmed and placed up-side down on top of the dough helps it to rise more quickly. Sometimes the bread is coarse; this is usually caused by over rising of the dough. The flour should be kept in a dry place free from any foreign odours such as onions, etc. (Secretary, Miss L. Stanway).

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		WOMEN'S BRANCHES.		
Saddleworth	5/11/35	11	Discussion	Miss G. E. Frost
Balumbah	1/11/35	17	Cake Decorating Demonstration—Mrs. Allen	Miss H. D. Jericho
Narridy	28/10/35	26	Address—W. J. Spafford	Miss B. Reynolds
Coonalpyn	10/10/35	16	Congress Delegates' Report	Miss E. E. George
Pinnaroo	1/11/35	20	Congress Delegates' Report	Miss N. A. Mattiske
Rendelsham	—/11/35	11	"Home-made Toys"	Mrs. W. Bignell
Sheoak Log	7/11/35	29	"Dairy Processes"—Mr. Taylor; "Butter Stabilization Scheme—Mr. Cundy	Miss K. M. Koch
Georgetown	8/10/35	18	Congress Delegates' Report	Miss J. Crawford
Coonalpyn	6/11/35	13	"Bacon Curing"—Mrs. Videon and Mrs. George	Miss E. E. George
Snowtown	31/10/35	30	Address—Miss E. Campbell	Mrs. A. Hocking
Pinbong	9/11/35	14	Discussion—"Useful Hints"	Miss D. M. Scholz
Wirrilla	—/11/35	—	Annual Meeting. "Uses of Citrus Fruit"—Mrs. H. Jacka	Mrs. W. R. Jones
Mangalo	13/11/35	12	Congress Delegates' Report	Mrs. F. Coles
Kalangadoo	12/10/35	—	Cooking Competition	Mrs. H. Brooks
Myponga	20/11/35	7	Question Box	Mrs. M. Bounds
Williamstown	6/11/35	5	"Cheese"—Mrs. Coleman	Mrs. G. E. Cundy

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		WOMEN'S BRANCHES—*continued.*		
Monarto South	16/11/35	13	"Flowers in Tubs and Boxes"—Miss E. Schnaars	Mrs. F. W. Liebelt
O'Loughlin	7/11/35	11	Rug Making Demonstration	Mrs. E. E. E. Lutz
Maltee	7/11/35	12	Congress Delegates' Report. Question Box	Mrs. J. A. Ferguson
Clare	2/11/35	35	Congress Delegates' Report. Demonstration—Mrs. Dux	Mrs. A. C. Pollock
Mudamuckla	6/11/35	17	"Health"—Mrs. Whyborn	Mrs. C. H. Kuhlmann
Wasleys	7/11/35	25	"Summer Dishes"	Miss G. Harding
Eurelia	6/11/35	9	Congress Delegates' Report	Mrs. E. P. Wall
Gladstone	12/11/35	—	Visit to Georgetown Branch	Mrs. L. J. Sargent
Balhannah	20/11/35	27	"Reading in the Home"—Rev. Drummond	Miss D. Spoehr
Millicent	15/11/35	—	Christmas Recipes, &c.	Miss K. M. Hutchesson
Tantanoola	9/11/35	12	"Christmas Gifts"—Mrs. Stafford. Congress Report—Mrs. Pycroft	Mrs. Gus Altschwager
Belalie	12/11/35	44	Paper—Mrs. Bailey	Miss E. L. Orchard
Devlin's Pound	4/12/35	13	Question Box	Miss E. Peters
Yurgo	24/11/35	7	Congress Delegates' Report	Mrs. R. E. Sanders
Kangarilla	21/11/35	25	"American Social Afternoon"	Mrs. C. Steer
Laura Bay	12/11/35	9	"Christmas Cooking"—Miss L. Blumson	Miss T. E. Barnett
Hope Forest	6/11/35	17	Third Annual Meeting	Miss M. E. DeCaux
Beetaloo Valley	18/11/35	9	Papers—Mesdames Flavel and Leesue	Mrs. E. A. Pearce
Devlin's Pound	12/11/35	14	Inaugural Meeting	Miss E. Peters
Warramboo	8/11/35	11	Congress Delegates' Report	Miss J. Patterson
Hope Forest	5/12/35	13	Congress Delegates' Report	Miss M. E. DeDaux
Wilmington	14/11/35	43	"Jam Making"—Mrs. Stevens. "Pastry"—Mrs. Schmidt	Mrs. P. Cole
Kybybolite	8/10/35	23	Christmas Gifts	Mrs. W. D. Kekwick
Warcowie	30/10/35	12	Demonstration of Sewing Machine Attachments—Mrs. Avery	Mrs. A. G. Avery
Wasleys	5/12/35	22	Papers—Misses Richter, Harding, and Sanders	Miss G. Harding
Belalie	10/12/35	45	Visit from Clare Branch	Mrs. E. L. Orchard
Auburn	29/11/35	23	Demonstration of Cake Decoration—Mrs. Finey	Miss L. J. Dennison
Wirrabara	21/11/35	30	"Christmas Gifts"—Mesdames Harding and Keynes	Mrs. Alex. Curtis
Sheoak Log	5/12/35	36	Christmas Recipes	Miss K. L. Koch
Morchard	27/11/35	19	Christmas Novelties	Miss F. Brown
Rendelsham	4/12/35	55	Christmas Party	Mrs. W. Bignell
Pinnaroo	6/12/35	8	Programme	Miss N. A. Mattiske
Gladstone	17/12/35	30	Cake Icing Demonstration—Mrs. Saint	Mrs. L. J. Sargent
Warcowie	23/11/35	19	Exhibition	Mrs. A. G. Avery
Clare	7/12/35	40	"Cake Decorating"—Mrs. W. M. Kendrick	Mrs. A. C. Pollock
Myponga	12/12/35	4	Discussion	Mrs. M. Bounds

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Angaston, Saturday, 29th February.
Mundalla, Wednesday, 4th March.
Mount Pleasant, Thursday, 19th March.

Agricultural Bureau Conferences, 1936.

River Murray (Swamps), at Wood's Point, Thursday, 20th February (Mr. F. P. Baily, The Point, Secretary).

Lower North, at Owen, Thursday, 27th February (Mr. A. Helps, Owen, Secretary).

Yorke Peninsula, at Arthurton, Wednesday, 4th March (Mr. T. H. Howlett, Box 8, Moonta, Secretary).

Mid North, at Beetaloo Valley, Thursday, 12th March (Mr. B. W. Giddings, Beetaloo Valley, Secretary).

South-East (Upper), at Bordertown, Wednesday, 1st April (Mr. L. H. Butler, Secretary).

South-East (Lower), at Kybybolite, Wednesday, 8th April (Mr. A. S. Shepherd, Kybybolite. Secretary).

Dairying, at Strathalbyn, Thursday, 21st April (Mr. Reg. Sissons, Strathalbyn, Secretary).

River Murray, at Block E, Thursday, 18th June (Mr. J. C. K. Brigham, Box 65, Renmark, Secretary).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Ration for Dairy Cattle from Farm Produce.

Replying to the Secretary of the Brimpton Lake Branch of the Agricultural Bureau, who asked:—"Can a suitable ration for milking cows be made from grains produced on the farm, wheat, oats, and barley; if so, what quantity of each should be used, and what quantity of the whole should be fed per lb. of milk produced; it is intended to crush the grain?" Mr. H. B. Barlow (Chief Dairy Instructor) said oats and barley in a crushed state make an excellent base for a concentrate mixture for dairy cows. If oats or barley are not available, crushed wheat can be used, but it is rather deficient in protein and high in carbo-hydrates. Pinched wheat is a much better feed for dairy cows than plump wheat.

A more or less ideal concentrate food would be a mixture of 100lbs. bran, 100lbs. crushed oats or barley, or a mixture of both, and 30lbs. of linseed meal, fed at the rate of 1lb. of the mixture for each 3lbs. to 4lbs. of milk given.

If any green stuff or ensilage is available, the bran is not essential. If green lucerne is available in any quantity, the linseed meal can be done without, except when maximum returns are required. This also applies when lucerne chaff forms the bulk ration in place of cereal chaff. Both wheaten and oaten chaff are much more valuable for dairy cows when cut on the green side.

If only cereal chaff and grains are available, feed as much chaff as the cow will clean up comfortably, with the crushed grain ration at the rate suggested. In addition, it is very essential to add to the feed a mineral mixture at the rate of 2ozs. to 4ozs. per cow per day. A mixture of bone meal and salt, or dicalcic phosphate and salt, or superphosphate and salt in equal proportions, will make a satisfactory mineral mixture, and is very essential to the health of the cattle. Water should be available at all times, and as much as the cows require.

Aiding Importers of Pedigree Stock.

The introduction of a plan for giving financial assistance to importers of pedigree breeding cattle, sheep, milch goats, and swine from the United Kingdom has recently been announced, following discussions between the Australian Agricultural Council and the Commonwealth Government. The only breeds of swine eligible for assistance will be Berkshire, Large White, Middle White, and Tamworth. The assistance will take the form of a contribution towards expenses incurred in the importation of the animals, but no assistance will be given toward the cost of the animals.

A statement issued by the Department of Commerce says that shipping companies have agreed that in lieu of the freight rates usually charged by them they will charge only out-of-pocket expenses actually incurred by them in provision of stalls, water, &c., and in loading and unloading the animals. The following flat rates have been fixed to cover these out-of-pocket expenses:—Cattle, 30 guineas, including boxes or pens; sheep, 10 guineas, including boxes or pens; milch goats, 10 guineas, including boxes or pens; pigs, 6 guineas, excluding pens. All expenses connected with the transport of the stock from the port of export in the United Kingdom to the port of importation in Australia will be borne in the following proportions:—Two-fifths by the importer, two-fifths by the Commonwealth and State Governments concerned in equal proportions, one-fifth by the Commonwealth Bank, subject to review after 30th June, 1936.

The project will apply only to animals for which a certificate of full registration by a recognised stud society is furnished, together with the vendor's certificate of breeding, and production record, if any. Applications for assistance under the plan, stating the class, breed, age and sex of the animal it is intended to import, the date of shipment, the name of the vessel, and the name of the shipping agent, shall be made by the purchaser of the animal to the Department of Agriculture of the State into which the animal is to be imported. The assistance will apply only if the stock are retained by the purchaser for at least two years from the date of importation.

The importers are required to pay the whole of the expenses connected with the importation of the stock. Shipping charges must be paid in London in sterling, in exchange for bills of lading, as customary. The project will operate in respect of stock shipped from the United Kingdom on or after 1st December, 1935. Arrangements have been made with the State Departments of Agriculture to give the necessary approvals on arrival in Australia of any stock in respect of which it has not been possible to issue a certificate of approval prior to their departure from the United Kingdom.

Production of Butter and Cheese.

The following returns show the production of butter and cheese in South Australia since 1st July, 1935:—

1935.	Butter. lbs.	Cheese. lbs.
July	1,239,452	550,368
August	1,583,330	693,739
September	1,810,860	939,282
October	2,438,672	1,063,195
November	2,109,159	1,061,467

AGRICULTURAL INQUIRIES.

[Replies supplied by W. J. Spafford, Deputy Director of Agriculture.]

"Black-Tip" of Wheat.

The Secretary of the Frayville Branch of the Agricultural Bureau asks:—"If Currawa wheat is badly tipped with black ends, is the wheat fit for use as seed? The sample is good."

Reply—Although the "black-tip" of wheat is often considered to be due to the plant having been affected with a fungus disease, such seed is generally quite safe to use at seeding time.

Milling Tests of Wheat.

"Which is the more important in testing wheat for milling purposes: the Pelshenke test or the dry gluten test?"

Reply—There is no comparison possible between the Pelshenke test for bread-making quality of wheats and the dry gluten content. The former is a test which gives some idea of what the bread-making qualities of wheats are, whereas the other is just a determination of the amount of gluten present in a flour. Sometimes the dry gluten content and the water absorbing power of the flour are taken together to show the strength of a flour, but the only real test is the baking test, wherein loaves of bread made and baked from all flours are compared.

Split Peas.

The Secretary of the Whitwarta Branch of the Agricultural Bureau asks:—"Can Western Australian white peas be made into split peas? If so, how can the average farmer split them? Is it necessary to have expensive machinery to do the work of splitting them?"

Reply—From the meagre amount of information available on the splitting of peas, it appears that there is no doubt about the possibility of using White Brunswick for the purpose, but special machinery is necessary to do the job. To come into the commercial field it would be necessary to get up-to-date machinery, but for household use there is no need to split the peas, and even if this was thought to be necessary, the chances are that the second thresher on a harvester, or some such apparatus, would take sufficient of the skins off to get a supply of split peas.

Phalaris tuberosa.

The Balhannah Agricultural Bureau asks, "What time of the year should Phalaris tuberosa *seed be sown in Balhannah district?"*

Reply—In the Balhannah district *Phalaris tuberosa* should be seeded in the autumn; in April if the land is in good germinating condition, but otherwise in May. It is very important that the land should be clean and free from weeds, and it is advisable to fallow the land, even if for a short period only, before attempting to establish the crop. *Phalaris* seed should not be mixed with other seed in ordinary conditions, and if a mixed pasture is desired, the other plants can be introduced after the *Phalaris* is one or two years old.

If the germinating test has shown the *Phalaris* seed to have a high germinating power, from 2lbs. to 4lbs. of seed per acre is ample. The seed can be mixed with superphosphate provided that it is sown not more than 4 hours after mixing.

Phalaris tuberosa can be cut with mower or scythe, and is a really good green fodder. In strong-growing stands the growth becomes so dense that it is a fairly heavy job cutting it, but it can be done without much trouble in most cases. Provided the hay is not left out in the fields too long after it has been cured as hay, it makes a good hay and is quite suitable for feeding to cows after being chaffed.

Oats for 16-25in. Rainfall Districts.

The Blackheath Agricultural Bureau asks, "Which is the best variety of oats to grow for grazing purposes in a district with a rainfall of 16*in. to* 25*in.?"*

Reply—"Mulga" is a good oat to grow for grazing purposes in a district where the annual rainfall might reach 25in. If to be grown for grazing only, better results would be secured from a mixture of about 30lbs. rye and 40lbs. oats per acre; the rye producing winter feed in greater abundance than will any other cereal and the oats continuing to grow well into the summer.

HORTICULTURAL INQUIRIES.

Pear Leaf Blister Mite.

Specimens of leaves of a pear tree, showing signs of insect attack, were forwarded to the Department of Agriculture for identification by a subscriber to the *Journal of Agriculture* at Mundalla. Mr. A. G. Strickland, M.Sc., Chief Horticultural Instructor, in reply to the inquiry, says the pear leaves have been subjected to attack by the pear leaf blister mite (*Eriophyes pyri*, Pagen). This mite is a very small creature, about one-hundredth of an inch in length, and passes the winter beneath bud scales. When buds commence to swell in the spring the over-wintering mites lay eggs on the under surface of unfolding leaves. The eggs hatch under the protection of the opening buds, and the young larvae burrow into leaves and set up irritation, which results in the development of small green blisters on the leaf surfaces. When the mites are fully grown they leave the blisters in which they have developed, and infest new leaves as they appear. The pest is fairly easily controlled by application of a strong lime sulphur spray (1gall. of lime sulphur concentrate in 10-15galls. of water) just before buds swell in spring. This strong spray should *not* be applied after bud movement has commenced.

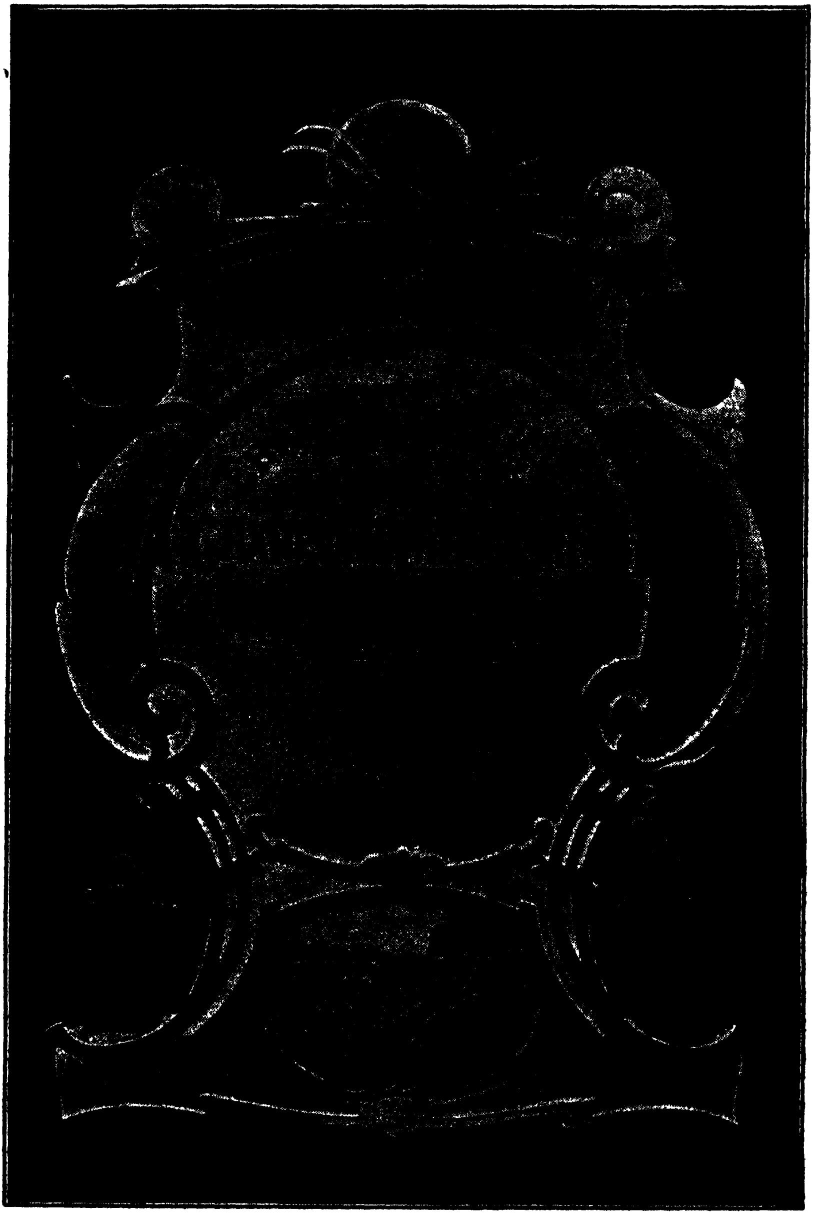
THE CHAMPIONSHIP WHEAT CROP COMPETITION.

(WON BY MR. W. H. WATKINS, YEELANNA.)

In his report on the Championship Wheat Crop Competition for the 1935-36 season, Mr. W. J. Spafford (Deputy Director of Agriculture) who judged the entries, states that Wheat Crop Competitions supervised by the Department of Agriculture have been conducted in South Australia for 12 years.

For the first six seasons, financial assistance was given by the Government, but unfortunately in 1931 and 1932 it was found necessary to discontinue the granting of this subsidy. However, in the following year a generous donation by the South Australian Farmers' Co-operative Union Limited materially assisted in the success of the Competitions, whilst for the past two seasons, the Government subsidy has been renewed. The help thus given has been a very big factor in maintaining interest in the Crop Competitions during the period of depression and the low price of wheat.

The wheat growing season of 1935-36 was notable for the very great difference in the crops grown in the districts recognised as good wheat growing districts, and those a little on the dry side. In the former case, really good yields were received, whereas in the lower rainfall places, crops were from fair to poor. Throughout the State the quality of the grain was really high, and in many cases this was so much so that considerably greater yields were received than were anticipated before the harvesting machines were started in the crops.



Wheat Crop Competitions were conducted in 19 districts, and the number of crops entered in these totalled 407. The judges appointed by the Department of Agriculture inspected all of the crops, and issued reports on each District Competition. Of the first prize winners of the District Competitions, the judges considered that 15 of them were sufficiently good to be inspected in the Championship Competition.

Table Showing Progress of Wheat Crop Competitions.

Year.	Districts Conducting Competitions.	Number of Crops Exhibited.
1924	12	290
1925	13	248
1926	17	444
1927	19	525
1928	22	634
1929	21	520
1930	19	473
1931	16	352
1932	20	385
1933	19	351
1934	18	328
1935	19	407

In 1927 the Royal Agricultural and Horticultural Society offered as a prize in connection with Wheat Crop Competitions conducted under the auspices of the Department of Agriculture, a Silver Challenge Shield of the value of 50 guineas, and annually a small replica of the Shield valued at 5 guineas.

The Royal Society desired specially to encourage the Wheat Crop Competitions, and in accepting the generous offer, the Government agreed to the conditions laid down by the Society, which were as follows:—

1. The prizes go to the person exhibiting the best crop in the Competition supervised by the Department of Agriculture, the Silver Challenge Shield to be held for a period of 12 months immediately succeeding the award, and the silver replica to become the absolute property of the winner.
2. The Challenge Shield, with the name of each year's winner engraved thereon, to be exhibited in the Town Hall or Institute nearest the farm on which the winning crop was grown.
3. The crop awarded first prize in each supervised District Competition to be taken as an entry for the Championship Competition, except in any case in which it is thought by the judge of the District Competition that the winning crop is not of sufficient merit to warrant inspection for the Championship trophy.
4. All entres for the Championship to be inspected by one judge. Such inspection to be undertaken in each district soon after the district judge has made his awards, but not before the crop has ripened.
5. Each competitor for the Championship to be required to stage one bag of grain and one sheaf (about 1ft. in diameter) of grain in the straw at the Royal Spring Show following the competition.

WINNERS OF THE CHAMPIONSHIP WHEAT CROP.

1927.	F. V. Trenorden, Bordertown. (Federation wheat.)
1928.	F. Coleman, Saddleworth. (Leak's Rustproof and Fondling Wheat.)
1929.	F. V. Trenorden, Bordertown. (Bena wheat.)
1930.	H. C. M. Pilgrim, Wolseley. (Gallipoli wheat.)
1931.	A. M. Dawkins, Gawler River. (Ford wheat.)
1932.	J. P. Carrigg, Hamley Bridge.. (Sword wheat)
1933.	H. Michael, Hilltown. (Dan wheat.)
1934.	P. McD. Smyth, Salter's Springs. (Sword wheat.)
1935.	W. H. Watkins, Yeelanna. (Sword wheat.)

· THE ENTRIES.

Because four of the fifteen entries in the Championship Competition contained two varieties, there were nineteen plots of wheat inspected, and of these 8 were of Sword, 4 of Ford, 2 of Ranee, and one each of Nabawa, Dan, Gallipoli, Aussie, and Geeralying. With one exception, all of the wheat was of good quality, being full, bright, and shotty, and obviously of heavy bushel weight. As is general in years of good quality grain, there was a general tendency to shed grain, but this weakness was really serious in one case only, although in some other cases it was easily noticeable and must have lowered the returns from the crops. So many of the crops appeared as though they would return about the same yield per acre as one another, that the placings of the entries into their order of merit depended upon the points allotted for good farming rather than for yield. The crops were of such general excellence that it was a particular pleasure to judge the competition this season.

THE AWARDS.

In reporting on the entries it has been decided to follow the practice of other years of indicating the crops which would have been placed second, and third to the winner of the Championship trophy, had this been an ordinary Competition, but the remaining crops are not shown in order of merit, and where any remarks are made on their crops, the exhibitors' names are placed in alphabetical order, and not according to points awarded. The awards, and a brief description of the crops submitted in the Competition, are set out below:—

CHAMPIONSHIP WHEAT CROP (SWORD).

W. H. Watkins, Yeelanna.

The Flinders Wheat Crop Competition was won by Mr. Watkins with this very nice crop of Sword wheat, which was afterwards adjudged the best crop submitted in the Championship Competition. Despite the fact that it was shedding badly, it was still a heavy-yielding crop, and had few other weaknesses as a Competition crop, except a few patches where Red Rust had done a little damage, and being old-type Sword, it was not all of one kind.

The land on which the crop was grown carried a wheat crop on fallow in 1931, was then left out as pasture for a year, grew an oat crop, and was fallowed for the 1935-36 crop. During the fallowing period the land was well worked, the ploughing being done in August after which it was harrowed in September, cultivated in October, cultipacked in January, cultivated in March, and harrowed and cultivated in May. On 6th and 7th June, Sword wheat at the rate of 70lbs. of graded and "dry" pickled seed was drilled in with a combine, together with 120lbs. of superphosphate per acre, and the whole field was then harrowed.

The thorough and careful soil working showed its effect in the crop, for it was as nearly free from weeds as it is possible to imagine a wheat crop grown under ordinary field conditions. A few isolated Wild Oat plants were present, but even these were most difficult to find. There had been just a little Spotted Rust on the flag of most plants, and a few patches had developed Red Rust, but the damage done on these small areas was little indeed. The wheat was typical old-time Sword, and as such was not as true to type as is desired, and, as is usual with this strain of Sword, contained some brown chaffed wheat and a few bearded plants. The drilling of the crop had been carried out very well, drill-misses being almost non-existent. The appearance of parts of the crop was lowered by patches that had been washed out or drowned out, but such acts of Providence do not affect the Competition value of the crop.

Everything about this very attractive crop—particularly the almost complete freedom from weeds—showed evidence of good farming practices, and Mr. Watkins is entitled to full credit for growing the Championship Crop by intelligent methods in which luck played no part.

R. L. Sluggett, Hilltown (Dan).

With this nice crop of Dan wheat Mr. Sluggett won the Midlands District Competition, and scored well in the Championship Competition. The land on which it was grown had been cropped heavily with wheat, and for years the rotation practised on this field had been the simple one of bare fallow-wheat-bare fallow-wheat. The fallow was prepared by ploughing in July, harrowing in September, and cultivating in October and April. During the second week in June, 90lbs. of graded and dry pickled wheat were drilled in with a combine with 90lbs. of superphosphate (45 per cent.) per acre.

A lot of Wild Oats were found throughout the crop, but other than this weed, the crop was clean. No evidence of diseases could be seen. There was a noticeable amount of admixture of other kinds in this crop, so that it could only be classed as fairly true to type. The drilling of the crop was really good, and any irregularity was due to the presence of "red" land in the field, on which the yield would be considerably lower than from the bulk of the crop, which was grown on more friable soil. Some of the heavy patches of crop had lodged rather badly. This heavy-yielding crop was an attractive Competition Crop, but was a little irregular and rather badly fouled with Wild Oats.

L. Wachtel, Palmer (Sword and Ranee).

With 30 acres of Sword and 20 acres of Ranee, the first prize in the Southern District Wheat Crop Competition was secured by Mr. Wachtel. The rotation of cropping under which the field had been worked for many years was the three-course one of fallow-wheat-pasture, and on the appearance of the crop, was a very suitable one, for the soil was obviously in good heart. The ploughing was done with a mould-board plough in July, and the furrow slice broken down in August with harrow, and from then on the cultivator or harrows were used when required. On 25th April seeding was carried out with a combine, using 71lbs. of graded and "dry" pickled seed, with 100lbs superphosphate (48 per cent.) per acre.

The crops were almost weed-free, there being just an isolated plant of Wild Oats in Sword, and a couple of Barley plants in Ranee as well. Sword showed a little Loose Smut, and odd plants affected with Flag Smut were seen in Ranee. Both varieties were fairly true to type, but showed some admixture of other kinds. The whole crop was remarkably well-drilled for the hilliness of the country, and was very even. Sword was shedding a little by harvest time.

This entry was an attractive Competition crop, exceptionally free from weeds, and extremely even and regular considering that it was grown on very hilly country, but was not such a heavy-yielding crop as some other entries. The farming practices of Mr. Wachtel are good, for the land has been kept in good heart, and cultivation is so thorough as to keep down weeds.

OTHER ENTRIES.

(In Alphabetical Order.)

W. Adams, Jamestown (Ranee).

This crop, which was grown on the farm of the Misses McLeod of Jamestown, won the Northern District Wheat Crop Competition, and was a fairly even crop of Ranee, but hardly heavy enough to win a State Championship. It was very clean, so far as weeds were concerned, except that there was a sprinkling of

Barley throughout, and odd plants of Wild Oats and Poppies as well as a little Hoary Cress. Loose Smut had been bad, there was just a little Flag Smut, and 3 or 4 very small patches affected with Take-all were located. Fairly true to type, and although there were a few drill misses here and there, it was an even and regular crop.

N. Boundy, Minlaton (Ford).

The four-course rotation of cropping of fallow-wheat-barley-pasture, is followed in the field which grew the crop of Ford which won the Southern Yorke Peninsula Crop Competition. The land was ploughed and harrowed in July, cultivated and harrowed in each of the months of August, September, March, and May. On 24th June a combine was used to sow 75lbs. of formalin-pickled seed with 90lbs. of superphosphate per acre.

Despite all the cultivation work put into the fallow, the crop was not really clean, for there was a lot of Charlock, Poppies, and Wild Oats in patches, a little King Island Melilot, and a few plants of Soapwort and Wild Mignonette. There were no signs of disease of any kind. The crop was of the old-time Ford, and was not particularly true to type, but was fair in this regard. Drilling was well done, and any patchiness present was due to weeds. The crop was shedding a fair amount of grain.

E. J. Buckley, Bordertown (Gallipoli).

The land on which Mr. Buckley grew the wheat crop which won the Tatiara Crop Competition had been left out as pasture for several years before being fallowed in 1934. The ploughing of the fallow was done in July, and it was harrowed twice in August, cultivated in September, October, and November, harrowed in March, and cultivated in April. At the end of May 70lbs. of graded and "dry" pickled seed were sown with 90lbs. of superphosphate per acre, and the land was immediately harrowed.

At seeding time Wimmera Rye grass seed was put in with the wheat, and this grass was thick and strong throughout the crop. There was also a lot of Wild Oats and some Canary Grass, Slender Thistle, and Poppies, so even without the Rye grass the crop was only fairly clean. There had been some Spotted Rust, and the later plants were carrying just a little Red Rust. So far as trueness to type was concerned, the crop was quite good, there being only a very light sprinkling of other kinds in it. Drilling was good, but the crop was very irregular, being drowned out in patches.

P. P. Cook, Mt. Damper (Ford).

No set rotation of cropping had been followed by Mr. Cook, but of recent years the field which carried the winning crop in the Le Hunte District Crop Competition had been treated as follows:—1930 fallow, 1931 wheat, 1932 pasture, 1933 oats, and 1934 fallow. The fallow was ploughed in July, cultivated in September and cultivated and harrowed in April. On 5th May seeding was carried out with a disc drill, when 55lbs. of graded and "dry" pickled seed and 90lbs. superphosphate (45 per cent.) were sown per acre.

The fallow received too little work to control all weeds, for there were some Sheepweed, Poppies, Wild Mustard, odd plants of Wild Oats, and a few Barley plants. There were signs of Spotted Rust having appeared, but no other diseases were seen. The crop was of old-type Ford, and carried a light infestation of other kinds. Drilling of the crop was carried out well, and the sample of grain being harvested was really good.

Dawkins and Aunger, Gawler River (Sword).

This entry won the Central District Wheat Competition, and the field which carried it had been worked on the fallow-wheat-oats-fallow rotation of cropping. The ploughing of the fallow was done in August, and it was cultivated in

September, harrowed in October, cultivated and harrowed in May. At the end of May 90lbs. "dry" pickled seed and 90lbs. of superphosphate (45 per cent.) were seeded to the acre, with an ordinary seed drill.

The crop was very clean indeed, there being only odd plants of Wild Mustard, Poppies, and Sheepweed. A little Bunt was found, and there was present just a little Red Rust. There may have been sufficient Rust to flatten the grains slightly, which was noticeable in this crop. Being old-type Sword, the crop showed admixture with other varieties. Drilling was well done, and any irregularity was due to portions of it having lodged fairly badly.

A very attractive Competition crop, except for lack of trueness to type, and the lodging in patches, but despite the latter, it was obviously a heavy-yielding crop.

A. N. & H. M. Freebairn, Owen (Sword).

The rotation of cropping followed in the field which carried the winning crop in the Balaklava District Crop Competition was the three-course one of fallow-wheat-oats. The fallow was ploughed in August, harrowed in September, and cultivated in September, October, November, and early May. In the middle of May a combine was used to sow 70lbs. of graded and "dry" pickled seed and 155lbs. of superphosphate (48 per cent.) per acre.

This crop contained only odd plants of Soapwort, Sheepweed, and Wild Mustard, and had a few very small patches of Cape-weed, and was a very clean crop indeed. There was enough Red Rust present on the stalks carrying the lower heads of the later patches to affect the yield and sample of grain, and odd plants had been troubled with Loose Smut. The entry was much nearer true-to-type than most crops of Sword, and was quite nice in this regard. A few misses by the drill were noticeable, but the little unevenness in evidence was due to patches of red soil in the field, where as usual the crop was reduced.

Stan Heinrich, Maitland (Geeralying and Sword).

Mr. Heinrich's crop consisted of 40 acres of Geeralying and 10 acres of Sword, and with it he won the Mid Yorke Peninsula Wheat Crop Competition. The field had been worked for some years on the three-course rotation of cropping of fallow-wheat-barley, and the 1934 fallow was skim-ploughed in September and harrowed, and again harrowed in October. Later in October it was skim-ploughed and harrowed, cultivated in November and again skim-ploughed in May. On 7th and 8th June graded and formalin-pickled seed was sown with a combine at the rate of 65lbs. per acre with 112lbs. of superphosphate (45 per cent.).

The crops were only fairly clean for there was some Wild Mustard, Shepherd's Purse, Catchfly and Poppy, and a little Wild Oats, Barley Grass, Canary Grass, and Soapwort. Geeralying showed just a little Red Rust, but Sword was disease-free. Geeralying was fairly true to type, showing a sprinkling of other kinds, whilst Sword was of the old-type, so only fair in this regard. Drilling was really good, and the crops were nice and even. Geeralying was shedding really badly, and in a season such as 1935-36, when most varieties shed to some extent, the losses from such a wheat must be very heavy.

Martin Bros., Kimba (Ford).

This, the winning crop in the Buxton District Wheat Crop Competition, was grown on land that was left out as pasture for two years, then carried a crop of Oats, and was fallowed before the wheat crop. The land was ploughed in July and cultivated in September, February, and early April. At the end of April 60lbs. of graded seed were sown with a combine, together with 80lbs. superphosphate per acre, and the land was immediately harrowed.

Unfortunately there was a lot of Barley in the crop, otherwise it was fairly clean, there being present a few plants of Wild Mustard, Wild Oats, and Cape Weed. Besides the ordinary weeds, Lucerne and Wimmera Rye grass were found. There appeared to have been a little Spotted Rust on the plants, but other than this, there were no indications of diseases. This crop was of old-type Ford and contained a little admixture of other kinds of wheat. Although the drilling was done fairly well, the crop was somewhat irregular.

E. S. ROSS, Parrakie (Sword).

The Chandos Wheat Crop Competition was won by this crop of Sword wheat, which was produced in a field which had been worked for some time on the three-course rotation of fallow-wheat-pasture. The land was fallowed in June, 1934, and during the third week of May, 1935, was seeded with 60lbs. of seed and 112lbs. of superphosphate per acre.

The crop was nice and clean containing some Wild Mustard and Poppy, and a little Barley grass and Cape-weed. There were no signs of disease of any kind. Some admixture of other varieties was seen, as is usual in old-type Sword. A fair number of small drill misses, but the irregularities were rather those of patchy growth. The crop was shedding a little over most of the area.

W. RYAN, Halbury (Sword).

Mr. Ryan worked the field on which the winning crop in the Mid North District Wheat Crop Competition was grown on the three-course rotation of cropping of fallow-wheat-pasture. The land was fallowed in June, harrowed twice in August and cultivated in September, November, April, and early May. In the third week in May a combine was used to sow 70lbs. of graded and "dry" pickled seed and 150lbs. of superphosphate (48 per cent.) per acre.

Hardly a weed was found in the crop, just odd plants of Wild Oats and Wild Mustard and some patches with Sheepweed. There had been some Spotted Rust and a little Flag Smut and Loose Smut. Seed of old-type Sword was used, so that the crop contained a sprinkling of other varieties. A few drill misses were seen, and about one-quarter of the crop was much lower in height than the remainder. There was some shedding of grain in most parts of the crop.

GORDON SIMS, Cleve (Sword and Nabawa).

With a crop of two varieties of wheat—35 acres of Sword and 15 acres of Nabawa—Mr. Sims secured first prize in the Jervois District Wheat Crop Competition, and the field on which the crops were grown had been farmed on the three-course rotation of cropping of fallow-wheat-Oats. The fallow was ploughed in July and cultivated in September, October, March, and April. Prior to sowing 70lbs. of graded and "dry" pickled seed with 112lbs. superphosphate to the acre, the land was culti-packed, and immediately after seeding, the harrows were put over the land.

The crop was beautifully clean, the only weeds in evidence being odd plants of Wild Mustard and isolated large plants of Cape-weed. A little Red Rust was found on both varieties, but was not serious. Sword was fairly true-to-type, containing some brown-chaffed kind, whilst Nabawa contained only odd plants which were bearded. Drilling was very fair, and although Sword was standing well and yielding good grain, it was shedding a little, whilst Nabawa had lodged in patches, and had some grain bleached in the head.

J. C. WESTBROOK, Arthurton (Ford and Aussie).

The Northern Yorke Peninsula District Wheat Crop Competition was won by this entry, which contained 42 acres of Ford and 8 acres of Aussie. The field in which the crop was grown had been cropped on the three-course rotation of cropping of fallow-wheat-barley, for some time. The 1934 fallow was ploughed in August and cultivated in September, October, March, and April. In the third week in June 90lbs. of graded and formalin-pickled seed were sown with a combine, together with 112lbs. of superphosphate (45 per cent.) per acre.

Besides some Barley in Ford, there were a few plants of Wild Oats and Poppies, whilst the Aussie contained only a few Wild Oat plants. Other than for the presence of such a bad weed as Barley—although not very prevalent—this entry would have been nice and clean. Ford was free from disease, whilst some Flag Smut was noted in Aussie. Ford was a crop of old-type with its admixture of brown-chaffed, bearded and late kinds, but Aussie contained only a few brown-chaffed plants. The crops were well drilled. Ford was shedding a lot, whilst Aussie was more or less matted together, although the crop was not heavy.

SOUTH AUSTRALIAN COMMITTEE OF AUSTRALIAN DAIRY COUNCIL—PASTURE SECTION OF DAIRY FARM COMPETITION.

Judged by E. M. Hutton, B.Sc. (Agric.), Field Officer.

Position.	Competitor.	Density and Evenness of Swards. 50	Botanical Composition. 50	Absence of Undesirable Weeds. 25	Pasture Subdivision. 25	Utilisation of Pasture Growth. 50	Total. 200
	ADELAIDE HILLS DISTRICT.						
1	T. M. Smee, Charleston ...	45	45	22	25	50	187
2	J. Brook, Meadows	40	45	22	25	50	182
3	C. Verco, Mount Compass	45	45	25	25	40	180
3	H. B. Peters, Mt. Compass	45	38	22	25	50	180
5	J. M. Irwin, Mount Barker	40	38	20	24	50	172
6	F. P. Smith and A. D. Woolley, Blackwood	45	30	15	21	45	156
7	E. H. Coote, Middleton ...	40	30	25	20	35	150
8	H. A. Woolley, Mt. Barker Junction	30	30	25	15	30	130
	MURRAY SWAMPS DISTRICT.						
1	E. Wise, Jervois	40	45	20	25	50	180
2	H. H. Jericho, Jervois ...	30	40	15	20	30	135
	SOUTH-EASTERN DISTRICT.						
	Judged by E. S. Alcock, Agricultural Instructor.						
1	Wookey, R. J., Robe......	40	43	24	23	42	172
2	Caine, F. C. Kongorong ...	42	44	22	23	40	171
3	Stuckey, Mrs. G. D., Rendelsham	39	41	22	22	43	167
4	Wray, J. M., Hynam	38	40	23	23	40	164
5	Carter, H. H., Mundalla ..	38	38	23	24	38	161
6	Kemp, A. C., Hatherleigh..	39	39	22	21	36	157
7	Allen, A. H., Mount Gambier	33	36	21	20	37	147
8	Kemp, A. C., Snuggery ...	30	30	20	18	35	133

ANNUAL REPORT ON PASTURE WORK, KYBYBOLITE, 1934-35.

[By L. J. Cook, R.D.A., Manager.]

(*Continued from page* 780.)

THE BREEDING OF ENGLISH LEICESTER MERINO COMEBACK LAMBS ON SUBTERRANEAN CLOVER AND WIMMERA RYE GRASS PASTURE.

For the past six seasons separate flocks of ewes have been grazed on the different series of fertilised plots, and careful records kept of the lambs produced. The flocks used on these plots in 1934 were constituted as follows:—

	Comebacks.					
	1929. Drop.	1930. Drop.	1931. Drop.	1932. Drop.	1933. Drop.	Total. Drop.
Flock E. grazed on Plots Nos. 4, 5, 6, 15, fertilised with Superphosphate only	19	14	14	9	18	74
Flock I. grazed on Plots Nos. 7, 3, 8, fertilised with Lime or Gypsum and Superphosphate	17	13	12	9	14	65
Flock G. grazed on Plots Nos. 10, 11, and 13, fertilised with Rock Phosphate	13	11	11	7	11	53
Flock KI. Check flock grazed on natural pasture fertilised with Phosphates and Lime	10	4	8	8	21	51

All of the above ewes were born and reared on their respective plots, and are daughters of half-bred English Leicester x Merino ewes by Merino rams. They have known no other type of feed throughout their life.

The following table shows the percentage of lambs marked for the immediate past four seasons from these four flocks:—

Table 15.—*Lambing Percentages of English Leicester Merino Ewes x with Merino Rams, Kybybolite,* 1931-34.

Flocks of Ewes.	Lambs Marked.				Average.	
	1931.	1932.	1933.	1934.		
	%	%	%	%	%	
EA ewes born 1929	80	85	105	116	96	80·5%
EB ewes born 1930	—	80	87	79	82	
EC ewes born 1931	—	—	80	71	76	
ED ewes born 1932	—	—	—	22	22	
IA ewes born 1929	76	65	106	94	85	78·8%
IB ewes born 1930	—	85	100	77	87	
IC ewes born 1931	—	—	54	75	65	
ID ewes born 1932	—	—	—	56	56	
GA ewes born 1929	69	86	108	123	96	85·7%
GB ewes born 1930	—	100	73	109	94	
GC ewes born 1931	—	—	73	73	73	
GD ewes born 1932	—	—	—	43	43	
KIA ewes born 1929	50	75	118	80	81	59·8%
KIB ewes born 1930	—	75	—	75	50	
KIC ewes born 1931	—	—	62	38	50	
KID ewes born 1932	—	—	—	25	25	

The lambs were sired by Merino rams, and the percentages are mostly satisfactory. The 1934 result from the 8-tooth ewes grazing on clover was particularly good, Flock GA marking 123 per cent., and EA 116 per cent., whereas the 2-tooth ewes bred poorly, Flock ED marking only 22 per cent. and KID 25 per cent. Averaging all seasons and ages of ewes, we find that those grazing on Subterranean Clover fertilised with Rock Phosphate have given the highest percentage with 85.7 per cent., those on same pasture fertilised with Superphosphate have given 80.5 per cent., and those on the same fertilised with Lime or Gypsum as well as Superphosphate marked 78.8 per cent., whilst the same age and type of ewes pasturing on well-fertilised natural pasture have only marked 59.8 per cent. This shows a decided advantage in favour of the sown Subterranean Clover pasture, but not a marked difference between the various manurings of this pasture. Considering only the 1929 ewes, in the three flocks on Subterranean Clover pasture, these ewes have averaged 92 per cent. lambs for four seasons, whereas on natural pasture they have average 81 per cent. Similarly the 1930 ewes have averaged 88 per cent. in three seasons on Subterranean Clover, and 50 per cent. on natural pasture; the 1931 ewes have averaged 71 per cent. and 50 per cent. respectively in two seasons; and the 1932 ewes (2-tooths) 40 per cent. on clover, and 25 per cent. on natural pasture. In every case those on the sown pasture have excelled those on natural pasture in breeding. This advantage is due to the greater fertility of ewes grazing on sown pasture, as during the past two seasons a definite record has been kept of the actual number of lambs born in each flock, and the percentage of lamb deaths between birth and marking has been much greater amongst the flocks grazing on sown clover pasture than on natural pasture. For the two seasons the loss on sown pasture has been 18.1 per cent., and that on natural pasture has been 5.6 per cent. Consequently there has been 100 per cent. of births on the former as against 63 per cent. on the latter. This result is no doubt due to the better development and earlier maturity of ewes bred and reared on sown Subterranean Clover pasture.

Regarding the lamb deaths, before marking, amongst the three flocks on sown pasture, these varied amongst the flocks, and when added to the percentages marked, it is shown that there is no significant difference between the number of actual births in these three flocks. Consequently, as yet, no variation in fertility of stock can be traced to the various manurings on this pasture.

The next table shows the average weights of Comeback lambs at weaning time from each flock, and each age of ewe.

TABLE 16.—*Weights of Comeback Lambs at Weaning, Kybybolite,* 1932-35.

Flocks of Ewes.	Weights of Lambs in Pounds.				Average.	
	5/1/32.	17/1/33.	4/1/34.	15/1/35.		
	lbs.	lbs.	lbs.	lbs.	lbs.	
EA ewes born 1929	61·9	65·5	49·8	53·6	57·7	53·7%
EB ewes born 1930	—	64·7	46·9	53·9	55·2	
EC ewes born 1931	—	—	45·6	52·4	49·0	
ED ewes born 1932	—	—	—	53·0	53·0	
IA ewes born 1929	67·0	67·2	46·0	62·8	60·8	55·8%
IB ewes born 1930	—	67·8	45·8	61·8	58·5	
IC ewes born 1931	—	—	39·0	60·7	49·9	
ID ewes born 1932	—	—	—	54·0	54·0	
GA ewes born 1929	64·1	56·2	48·2	53·8	55·6	57·3%
GB ewes born 1930	—	62·5	67·0	65·9	65·1	
GC ewes born 1931	—	—	53·8	61·4	57·6	
GD ewes born 1932	—	—	—	51·0	51·0	
KIA ewes born 1929	57·3	54·9	47·5	44·0	50·9	45·4%
KIB ewes born 1930	—	48·7	—	46·5	47·6	
KIC ewes born 1931	—	—	46·6	40·5	43·6	
KID ewes born 1932	—	—	—	39·5	39·5	
Average	62·6	60·9	48·7	53·4	53·1	

Table 16 shows that there has been a considerable variation in weight of lambs from season to season, the 1931 and 1932 drops weighed over 60lbs. each, whereas 1933 drop averaged only 48.7lbs., and this season's 53.4lbs. This is probably a seasonal effect, due to the variation in quality of spring and early summer feed. The heavy November rains of 1933 tended to wash valuable food ingredients from the matured plants, and the somewhat late spring rains of 1934 did not allow for the usual full and complete growth of clover and seed formation. The percentage of clover would appear to be a governing factor. The pastures of the plots fertilised with Rock Phosphate contained a higher proportion of clover than the other plots, and it is perhaps significant that the lambs reared on the former were somewhat heavier at weaning time, namely, 57lbs. on average, as against 56lbs. and 54lbs. on the other clover plots, and only 45lbs. on the natural pasture. More annual grasses with their objectionable seed heads and less clover seed amongst the dry feed had a detrimental effect on the lamb development.

DEVELOPMENT OF COMEBACK EWES ON SUBTERRANEAN CLOVER AND WIMMERA RYE GRASS PASTURE.

The Comeback ewes in the above flocks have been grazed on their respective plots from birth, excepting for a few weeks at weaning and mating times, when they were pastured on similar type of pasture. During each season there has been a marked variation in the rate of development. Each flock has increased in weight during the growing periods of pastures, and decreased during the dry-feed periods. On the sown pasture every season, with all ages of ewes, the development has been greater, and has been maintained better by the ewes throughout their life, than the controls on natural pasture.

Winter growth of *Phalaris tuberosa* and Subterranean Clover pastures grazed and ungrazed.

The 1929 ewes have in their five seasons on the sown pasture averaged 110lbs. live weight, and on the natural pasture 91lbs., a maintained increase of 19lbs. (20.5 per cent.) in live weight in favour of the sown pasture.

The 1930 ewes have in their four seasons on the sown pasture averaged 106lbs., and on the natural pasture 91lbs., an increase of 15lbs. (17 per cent.).

The 1931 ewes have in three seasons on sown pasture averaged 95lbs., and 81lbs. on natural pasture, an increase of 14lbs. (17 per cent.).

The 1932 ewes have in two seasons averaged 94lbs. and 78lbs. respectively, an increase of 16lbs. (21 per cent.), whilst the 1933 ewes for their initial season as hoggets have averaged 80lbs. on sown and 74lbs. on natural pasture, an increase of 6lbs. or 8 per cent.

Collecting all ages together, the ewes on sown pasture for the five seasons show an average greater live weight of 16.8 per cent. than those on well-fertilised natural pasture.

Table 17 shows the details of yearly maximum and minimum live weights attained by each flock each season.

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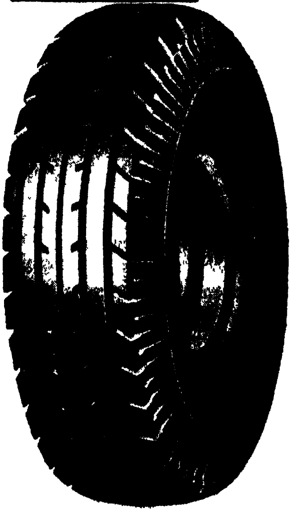

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Table 17.—*Maximum and Minimum Live Weights of Comeback Ewes, Kybybolite, 1930-35.*

	Weight of Sheep in Lbs.						
	Control Flock KI.	Flock E.	Increase over controls.	Flock I.	Increase over controls.	Flock G.	Increase over controls.
1929 Ewes.							
Minimum, 1930	58·5	60·5	2·0	62·8	4·3	63·0	4·5
Maximum, 1930	88·1	105·7	17·6	104·4	16·3	109·5	21·4
Minimum, 1931	82·2	98·4	16·2	97·9	15·7	102·4	20·2
Maximum, 1931	100·6	115·6	15·0	117·5	16·9	119·7	19·1
Minimum, 1932	84·2	98·3	14·1	101·4	17·2	102·0	17·8
Maximum, 1932	117·9	138·6	20·7	141·8	23·9	134·5	16·6
Minimum, 1933	91·2	111·5	20·3	113·5	22·3	107·7	16·5
Maximum, 1933	105·5	137·4	31·9	140·5	35·0	129·6	24·1
Minimum, 1934	84·0	102·1	18·1	103·1	19·1	102·0	18·0
Maximum, 1934	102·5	128·1	25·6	130·2	27·7	124·8	22·3
Minimum, 1935	89·7	106·5	16·8	113·6	23·9	106·9	17·2
Means......	91·3	109·3	18·0 (19·7%)	111·5	20·2 (22·1%)	109·3	18·0 (19·7%)
				20·5%			
1930 Ewes.							
Minimum, 1931	54·2	62·4	8·2	61·5	7·3	69·6	15·4
Maximum, 1931	85·5	99·9	14·4	102·6	17·1	107·2	21·7
Minimum, 1932	74·7	88·4	13·7	91·3	16·6	97·2	22·5
Maximum, 1932	106·2	124·9	18·7	121·6	15·4	136·2	30·0
Minimum, 1933	79·5	104·9	25·4	100·5	21·0	106·6	27·1
Maximum, 1933	114·0	125·4	11·4	125·3	11·3	127·0	13·0
Minimum, 1934	92·7	101·9	9·2	97·7	5·0	104·5	11·8
Maximum, 1934	116·2	128·9	12·7	118·2	2·0	131·5	15·3
Minimum, 1935	94·8	113·0	18·2	106·5	11·7	115·4	20·6
Means......	90·9	105·5	14·6 (16·1%)	102·8	11·9 (13·1%)	110·6	19·7 (21·7%)
				17%			
1931 Ewes.							
Minimum, 1932	44·4	46·7	2·3	43·6	—	44·9	0·5
Maximum, 1932	85·5	102·5	17·0	98·1	12·6	105·1	19·6
Minimum, 1933	72·6	90·4	17·8	86·5	13·9	90·0	17·4
Maximum, 1933	94·7	114·9	20·2	111·8	17·1	106·3	11·6
Minimum, 1934	77·5	91·8	14·3	92·7	15·2	90·2	12·7
Maximum 1934	101·6	119·9	18·3	112·0	10·4	122·7	21·1
Minimum, 1935	90·0	108·5	18·5	101·7	11·7	106·9	16·9
Means......	80·9	96·4	15·5 (19·1%)	92·3	11·4 (14·1%)	95·2	14·3 (17·7%)
				17%			
1932 Ewes.							
Minimum, 1933	61·3	70·6	9·3	71·1	9·8	66·4	5·1
Maximum, 1933	85·6	95·6	10·0	99·4	13·8	94·9	9·3
Minimum, 1934	72·1	82·1	10·0	85·8	13·7	82·3	10·2
Maximum, 1934	90·9	119·4	28·5	118·3	27·4	111·4	20·5
Minimum, 1935	79·0	110·4	31·4	106·9	27·9	98·0	19·0
Means......	77·8	95·6	17·8 (22·9%)	96·3	18·5 (23·8%)	90·6	12·8 (16·5%)
				21·1%			
1933 Ewes.							
Minimum, 1934	61·5	53·9	—	60·3	—	65·5	4·0
Maximum, 1934	84·4	85·2	0·8	94·9	10·5	104·5	20·1
Minimum, 1935	76·4	76·9	0·5	87·4	11·0	93·4	17·0
Means......	74·1	72·0	—6·3 (2·8%)	80·9	6·8 (9·2%)	87·8	13·7 (18·5%)
				8·3%			
Total percentage difference .	—		15%	16·5%		18·8%	
				16·8%			

The above results show that the ewes grazing on sown pasture fertilised with Rock Phosphate have maintained the greatest weights, 18.8 per cent. greater than those on natural pasture, whilst those on similar pasture fertilised with Lime and Superphosphate have maintained 16.5 per cent. better development, and those on the same pasture fertilised only with Superphosphate have maintained 15 per cent. better development than the controls.

Table 18.—*Wool Production of Comeback Ewes Bred on Sown Pasture Compared with Those Bred on Natural Pasture.*

	Wool per Sheep.										Average per Annum.		
	1930.		1931.		1932.		1933.		1934.				
	Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.		
1929 Ewes.													
GA	9 1		10 7		9 11		8 5		8 12		9 4		Increase 11%
IA	8 7	8 10	9 9	9 14	9 9	9 11	8 11	8 9	8 10	8 11	9 0	9 2	
EA	8 6		9 11		9 14		8 11		8 12		9 1		
KIA		6 5		8 12		9 6		7 13		8 10		8 3	
1930 Ewes.													
GB	—		9 12		10 7		8 14		9 12		9 11		23%
IB	—		9 1	9 8	10 2	10 1	8 15	8 14	9 7	9 8	9 6	9 6	
EB	—		8 11		9 10		8 12		9 5		9 1		
KIB	—			6 9		8 10		7 0		8 6		7 10	
1931 Ewes.													
GO	—		—		8 5		8 5		9 11		8 12		Decrease 4%
IO	—		—		7 3	8 0	8 0	8 6	8 7	9 0	7 14	8 7	
EO	—		—		8 7		8 13		8 15		8 12		
KIO	—		—			8 7		8 3		9 12		8 13	
1932 Ewes.													
ID	—		—		—		8 11		8 10		8 11		Increase 1½%
ED	—		—		—		8 4	8 10	9 4	8 15	8 12	8 12	
KID	—		—		—		8 14		8 15		8 14		
								8 8		8 13		8 10	
1933 Ewes.													
GE	—		—		—		—		9 7		9 7		Decrease 4%
IE	—		—		—		—		8 8	9 0	8 8	9 0	
EE	—		—		—		—		9 2		9 2		
KIE	—		—		—		—			9 5		9 5	

	Two-tooth Ewes, Five Years' Average.		Four-tooth Ewes, Four Years' Average.		Six-tooth Ewes, Three Years' Average.		Eight-tooth Ewes, Two Years' Average.		Full Mouth Ewes, One Year.	
	Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.		Lbs. Ozs.	
Flock G	9 1		9 7		9 7		9 0		8 12	
Flock I	8 5	8 11	9 4	9 5	9 0	9 3	9 1	9 0	8 10	8 11
Flock E	8 11		9 4		9 3		9 0		8 12	
Flock KI		7 13		8 9		8 11		8 1		8 10
Increase sown over natural pasture		0 14 (11%)		0 12 (9%)		0 8 (6%)		0 15 (12%)		0 1 (1%)

This table shows the average wool production per sheep each season for the life of the sheep grazing on the variously fertilised Subterranean Clover and Wimmera Rye Grass Plots (Flocks G.I.E) compared with Flock KI. that has been bred and reared on top-dressed natural pasture.

The wool production of the flocks on sown pasture this season, 1934-35, was just a little above the average for the immediate past five seasons, whereas that from flock on well-manured natural pasture was much better than usual, equalling, and in some cases exceeding, that produced by ewes on sown pasture.

However, for the five seasons the ewes on clover pasture have averaged 9lbs. wool per head per year, whilst those on natural pasture have averaged 8lbs. 5ozs. per head, a difference of 8 per cent. in favour of sown pasture. The lower section of the Table gives the wool produced per year from the ewes at their respective ages. For five seasons two-tooth ewes on sown pasture have yielded 8lbs. 11ozs. each, 11 per cent. more than on top-dressed natural pasture, which yielded 7lbs. 13ozs. per head. For four seasons four-tooth ewes have yielded 9lbs. 5ozs. each on sown pasture, 9 per cent. more than on natural pasture with 8lbs. 9ozs. per head. For three seasons six-tooth ewes have yielded 9lbs. 3ozs.

each on sown pasture, 6 per cent. better than 8lbs. 11ozs. yielded on natural pasture. For two seasons eight-tooth ewes have produced 9lbs. on clover, and 8lbs. 1oz. on natural pasture 12 per cent. better, and the aged ewes with 8lbs. 11ozs. and 8lbs. 10ozs. respectively have yielded 1 per cent. better. It is, therefore, quite apparent that a sown pasture of Subterranean Clover and Wimmera Rye Grass has definitely increased the wool production per head over well-fertilised natural pasture, although the increased wool produced of recent years from the natural pasture indicates that the continued applications of fertiliser are gradually bringing these pastures nearer the production ability of the sown pasture.

Results, however, continue to show little difference from the various types of fertilisers used on the sown pasture. Those ewes grazing on the pasture fertilised with Rock Phosphate have yielded 9lbs. 3ozs. wool each per annum, those on pasture fertilised with Superphosphate have yielded 9lbs., whilst those on that fertilised with Lime or Gypsum and Superphosphate have yielded 8lbs. 13ozs.—a difference of only 6ozs. per head between the highest and lowest averages.

HEALTH OF SHEEP.

With reference to the health of sheep in these flocks, the following table shows the deaths and percentages that have occurred during the five seasons under review:—

TABLE 19.—*Deaths of Comeback Ewes*, 1930-35.

Flock.	1930.	1931	1932.	1933.	1934.	Average
Sown Pastures—						
GA 15 ewes	1 (6·7%)	1 (9%)	1	0	0	
GB 11 ewes ...		1	1 (5·6%)	0	0	
GC 11 ewes......			0	0 0%	0 0%	4·05%
GD 7 ewes				0	0	
GE 11 ewes	—	—	- -	—	0	
IA 18 ewes	0 (0%)	2 (16·7%)	0	0	1	
IB 13 ewes	—	3	1 (2·3%)	0	0	
IC 13 ewes	—	—	0	1 (1·9%)	0 (3·08%)	4·8%
ID 9 ewes	—	—	—	0	1	
IE 14 ewes	—	—	—	—	0	
EA 21 ewes	1 (4·8%)	0 (0%)	1	0	0	
EB 15 ewes	—	0	0 (2%)	1	0	
EC 15 ewes......	—	—	0	1 (5·1%)	1 (2·7%)	2·91%
ED 10 ewes	—	—	—	1	0	
EE 18 ewes	—	—	—	—	1	
Total G, I, E	2 (3·7%)	7 (7·78%)	4 (3·1%)	4 (2·61%)	4 (2·08%)	3·85%
Total GA, IA, EA .	2 (3·7%)	3 (5·88%)	2 (3·92%)	0 (0%)	1 (2·04%)	3·11%
Total GB, IB, EB .	—	4 (10·26%)	2 (5·13%)	1 (2·56%)	0 (0%)	4·49%
Total GC, IC, EC ..	—	—	0 (0%)	2 (5·13%)	1 (2·7%)	2·61%
Total GD, ID, ED .	—	—	—	1 (3·85%)	1 (4%)	3·92%
Total GE, IE, EE .	—	—	—	—	1 (2·3%)	2·33%
Natural Pasture—						
KIA 12 ewes	0 (0%)	0 (0%)	1 (8·3%)	1 (9·1%)	0 (0%)	3·48%
KIB 4 ewes	—	0	0	0	0	0%
KIC 8 ewes	—	—	0	0	0	0%
KID 8 ewes	—	—	—	0	0	0%
KIE 21 ewes	—	—	—	—	1 (4·8%)	4·76%
Total KI	0 (0%)	0 (0%)	1 (4·17%)	1 (3·23%)	1 (1·96%)	1·87%

The losses in 1934 were approximately equal on both types of pasture, there being four deaths (2.08 per cent.) on sown pasture amongst 192 ewes, and one death (1.96 per cent.) on natural pasture amongst 51 ewes. It is noted that most deaths occurred during 1931 amongst the flocks grazing on sown pasture. The loss was 7.78 per cent. that season—more than double the loss of any other year—and these deaths were due almost entirely to Entero-Toxaemia, which affected the sheep during late winter and early spring.

For the five seasons the average loss on the sown pasture has been 3.85 per cent. per year, and on the topdressed natural pasture 1.87 per cent., showing that where the system of rotational grazing has been observed throughout the growing periods, the losses have not been unduly high, but have been somewhat higher on sown pasture than on natural pasture. This fact is verified by referring to an earlier portion of this paper, in which it is shown that the losses amongst 87 ewes in Flocks A, B, C, and D on natural pasture have only been 1.53 per cent. per annum over a period of six seasons. The deaths on natural pasture have occurred more amongst six and eight-tooth ewes, whereas the deaths on sown pasture have been greatest amongst younger ewes. The losses have been slightly greater on sown pasture when fertilised with Lime and Superphosphate, than when fertilised with Rock Phosphate, 4.8 per cent. and 4.05 per cent. respectively, whilst they have been 2.9 per cent. on clover fertilised only with Superphosphate. The greatest loss has occurred amongst ewes born in 1930 and reared on sown pasture, their annual loss being 4.49 per cent. These ewes lost heavily as two and four-tooths, but this year no deaths occurred amongst them.

The losses of lambs on the two types of pasture have been, between birth and marking, 5.6 per cent. on natural pasture and 18.1 per cent. on sown pasture, and between marking and weaning, 11.5 per cent. on natural pasture and 3.2 per cent. on sown pasture.

Finally, in this experiment, by allowing for deaths, and discounting lamb grazings, and counting the actual ewes carried on these plots, we find that the following wool per acre per annum has been produced by the various aged ewes:—

During five seasons the 1929 ewes have yielded 32lbs. 6ozs. on sown pasture, and 23lbs. 9ozs. on natural pasture—37 per cent. increase.

During four seasons the 1930 ewes have yielded 34lbs. 5ozs. on sown pasture, and 22lbs. 7ozs. on natural pasture—53 per cent. increase.

During three seasons the 1931 ewes have yielded 31lbs. 13ozs. on sown pasture, and 26lbs. 6ozs. on natural pasture—21 per cent. increase.

During two seasons the 1932 ewes have yielded 33lbs. 11ozs. on sown pasture, and 26lbs. 6ozs. on natural pasture—28 per cent. increase.

For one season the 1933 ewes have yielded 34lbs. 10ozs. on sown pasture, and 30lbs. 12ozs. on natural pasture—13 per cent. increase.

These figures show a consistent difference, and an increased production of 30 per cent. in wool per acre due to the cultivated pasture.

PHALARIS TUBEROSA COMPARED WITH WIMMERA RYE GRASS.

Five seasons' results are now available of two five-acre plots, comparing *Phalaris tuberosa* with Wimmera Rye Grass, and an additional three plots of each were established in 1934 for a further five-year test of the two grasses for developing sheep and wool production. They are all grown in combination with Subterranean Clover, and in 1934 the two older established plots were both grazed until towards the end of September, then closed from stock, and mown in November for hay.

Table 20 shows the grazing yields for the five seasons, and the yield of cured hay per acre taken from the plots.

TABLE 20.—*Sown Grasses and Subterranean Clover*, 1930-35.

Season.	Grazing (Sheep per Acre).	
	Wimmera Rye and Subterranean Clover.	*Phalaris tuberosa and* Subterranean Clover.
1930-31	2·47	1·64
1931-32	1·70	3·52
1932-33	2·41	3·82
1933-34	3·70	3·52
1934-35	2·93	2·58
Mean grazing	2·64	3·02
Hay yield, 1934-35	1 ton 1cwt. 45lbs.	1 ton 1cwt. 67lbs.

These results show that for the five seasons *Phalaris tuberosa* and Subterranean Clover have carried 3.02 sheep per acre, 0.38 sheep more than the Wimmera Rye and Subterranean Clover, although for the immediate past two seasons the latter has produced more feed than the *Phalaris tuberosa.*

The three pairs of plots established in 1934 were all sown with 4lbs. of grass seed per acre. One pair was sown on land that had been under topdressed Subterranean Clover for 10 years, and produced very fine stands of both grasses. Grazing was taken from them during late winter and early spring, and they were closed from stock in mid-September, and cut for meadow hay on 19th November. The Wimmera Rye Grass plot yielded 1.63 sheep per acre in grazing, and 2 tons 1cwt. 99lbs. baled hay per acre. The *Phalaris tuberosa* plot yielded 0.59 sheep per acre in grazing, and 1 ton 9cwts. 26lbs. baled hay.

Another pair of plots was sown on land that had been under topdressed clover for four years, and produced good stands of both grasses, but not nearly such thick and vigorous growths as the former two plots that had been under clover for the longer period. The Wimmera Rye plot was grazed until 26th September, and then allowed to mature, and produce ample seed. A fair amount of summer grazing was obtained, and for the season 1.88 sheep per acre were carried. The *Phalaris tuberosa* was grazed until October, and mown for hay in November. This plot yielded 19cwts. 98lbs. cured hay per acre, and 1.45 sheep in grazing, but approximately half of the grazing was secured from the aftermath during the summer months. Both of the above pairs of plots received 1cwt. 45 per cent. Superphosphate per acre at seeding.

The third pair of plots was established on virgin land that was fallowed in December, 1933, and sown down in May, 1934, with 4lbs. grass and 4lbs. Subterranean Clover seed, and 2cwts. 45 per cent. Superphosphate per acre. The growth of grass on these plots was very much less, but quite useful stands were obtained. The Wimmera Rye yielded 0.96 sheep and the *Phalaris tuberosa* 0.87 sheep per acre, but the former could not be fully grazed in spring, as it was necessary to allow it to seed well.

These results are typical of the two grasses, the Wimmera Rye is invariably the better producer during the first season of growth, and very little feed is available from *Phalaris tuberosa* during its first winter after autumn sowing. Moreover, on these types of soils, the advantage of soil preparation with some years' clover growing before seeding an expensive grass like *Phalaris tuberosa* is considerable. Wimmera Rye is the better grass to use initially with Subterranean Clover for the development of these lands.

HAWKE'S BAY PERENNIAL RYE GRASS.

Hawke's Bay Certified Rye Grass has been sown in four two-acre fields—No. 9D was sown in 1931, Nos. 9C and 9B in 1932, and No. 9A in 1934, the former with Alsike Clover, and the latter three in combination with Subterranean Clover. Some *Phalaris tuberosa* was included with the 1932 and 1934 seedings, but this made very little growth during the first season, against the early vigorous growth of Rye plants. Consequently the bulk of the grass growth produced has been Rye Grass, and it has proved inadvisable to sow *Phalaris tuberosa* in conjunction with Perennial Rye Grass.

The grazings received from the four fields since seeding to pasture have been as follows:—

TABLE 21.—*Hawke's Bay Rye Grass Grazing Results, Kybybbolite,* 1931-35.

Field.	Season.	Grazing (Sheep per Acre.)
No. 9D	1931-32	1·43
"	1932-33	3·57
"	1933-34	2·21
"	1934-35	2·94
No. 9C	1932-33	2·12
"	1933-34	2·36
"	1934-35	3·73
No. 9B	1932-33	3·00
"	1933-34	2·39
"	1934-35	3·96
No. 9A	1934-35	5·00
Mean	....	2·97

The comparative high first-year yields of Fields Nos. 9B and 9A are due to the pastures being sown on well-prepared fallowed land, the other two were sown on cereal stubbles. The average of 2.97 sheep per acre per annum is a good return from the grass, which gives a very useful bite of green quickly following summer and autumn rains, but does not provide as good winter growths as the annual grasses. It is noticeable that the plants appear to be persisting a little better than those in previous trials, but nevertheless the percentage of Rye Grass in these pastures has been diminishing each season, and the amount of annuals increasing. There has been a very heavy death of Rye Plants this last summer, the third and fourth summer after establishment.

Careful readings of counts and estimations of plant species are being recorded, and the following table shows the average monthly percentage estimations of pasture species for two seasons in the three fields established in 1931 and 1932:—

TABLE 22.—*Botanical Analysis of Perennial Rye Grass Fields.*

Species.	Field No. 9D.		Field No. 9C.		Field No. 9B.	
	1933.	1934.	1933.	1934.	1933.	1934.
	%	%	%	%	%	%
Perennial Rye Grass	53·8	41·4	50·0	35·5	32·7	22·6
Annual Grasses	—	14·2	—	17·8	—	2·5
Phalaris tuberosa	—	—	0·8	1·6	6·7	8·3
Clovers	8·5	18·2	22·5	30·1	31·8	54·8
Erodium	—	0·3	—	trace	—	trace
Capeweed	—	trace	—	0·1	—	0·2
Miscellaneous	6·4	6·7	12·0	3·5	12·5	2·8
Bare Space	31·3	19·2	14·7	11·3	16·3	8·8

The principal factors revealed by this table are (1) the reduction by 27 per cent. in 1934 of the amount of Perennial Rye Grass on the three fields, (2) the increase by 32 per cent. in the amount of *Phalaris tuberosa* on the two fields in which it was sown, (3) the increase by 64 per cent. in the amount of Clover growths in the three fields, (4) the influx of annual grasses on all fields, especially Nos. 9D and 9C (5) the reduction of amount of bare space by 37 per cent.

The following table of counts of plants taken from five fields containing Perennial Rye Grass, and four fields containing *Phalaris tuberosa*, during the last three autumns, further illustrates the poor persistency of Perennial Rye Grass against the good persistency of *Phalaris tuberosa*.

TABLE 23.—*Counts of Perennial Grass Plants, Kybybolite,* 1933-35.

	Plants per Square Metre.		
	1933.	1934.	1935.
Hawke's Bay Perennial Rye—			
Field No. 9D, sown 1931	87	64	23
Field No. 9C, sown 1932	63	54	6
Field No. 9B, sown 1932	100	50	3
Field No. N1, sown 1932	111	101	4
Field No. N2, sown 1932	79	86	5
Means	88	71	8
Phalaris tuberosa—			
Field No. 9C, sown 1932	11	14	10
Field No. 9B, sown 1932	37	29	32
Field No. N1, sown 1932	6	6	5
Field No. N2, sown 1932	5	9	6
Means	15	14	13

This result shows the death of Perennial Rye Grass plants during 1933-34 to have been 19 per cent., and in 1934-35 to have been 72 per cent. The death of these during last summer was extremely high, in only one field (No. 9D) have they persisted much at all, but the plants in this field are not very healthy. This latter field is one, without Subterranean Clover, hence it is apparent that the heavy growth of clover in the other fields so used the available moisture last season that there was insufficient soil moisture left to keep the Rye Grass plants alive.

The deeper rooted *Phalaris tuberosa*, however, did not suffer in this respect, and in every field the plants are persisting.

Field No. 9B, sown in 1932, was divided at seeding into five equal sections, and sown with various mixtures of Perennial Rye Grass and *Phalaris tuberosa*, all with 2½lbs. Subterranean Clover seed and 1cwt. 45 per cent. superphosphate per acre. The following table shows the percentage monthly estimates of pasture species growing on them during the last two seasons.

TABLE 24.—*Botanical Analysis of Pasture Mixture Plots,* 1933-35.

Species.	Plot No. 1, *Phalaris* only.		Plot No. 2, Per. Rye only.		Plot No. 3, *Phalaris* 50%, Per. Rye 50%.		Plot No. 4, *Phalaris* 66%, Per. Rye 33%.		Plot No. 5, *Phalaris* 33%, Per. Rye 66%.	
	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.	1933.	1934.
	%	%	%	%	%	%	%	%	%	%
Phalaris tuberosa..	29·9	34·1	—	—	0·9	3·0	2·4	3·0	0·1	1·2
Perennial Rye Grass	—	—	43·0	29·5	39·5	25·2	35·6	27·5	45·5	30·6
Annual grasses.....	—	—	—	1·7	—	4·4	—	3·8	—	2·6
Clovers	23·0	49·3	33·9	59·2	35·6	58·2	39·6	55·9	27·0	51·4
Capeweed	—	trace	—	0·1	—	—	—	0·1	—	1·0
Erodium	—	0·1	—	—	—	—	—	—	—	—
Miscellaneous	27·9	8·6	8·7	1·1	9·1	0·6	7·7	1·7	8·9	2·1
Bare space	19·2	8·0	14·4	8·3	14·9	8·6	14·7	7·9	18·5	11·0

Factors to be noted from this table are (1) the reduction of Perennial Rye Grass on every plot, an average of 31 per cent. on its four plots; (2) increase of *Phalaris tuberosa* on every plot, an average of 24 per cent. on its four plots; (3) the small amount of *Phalaris tuberosa* on plots where it was sown in conjunction with Perennial Rye Grass, whereas on Plot No. 1, where it was sown alone, there has been in 1934 a greater percentage of grass than any of the other four plots; (4) a little annual grass has come on four of the plots during 1934; (5) increase of Subterranean Clover on all five plots, averaging 75 per cent. more in 1934.

Finally, the results from this work with Certified Perennial Rye Grass shows that it is not suitable for permanent pasture under local conditions. Few plants persist more than three seasons, and unless a strain can be evolved particularly suitable for the conditions it will not be advisable to continue with its culture.

Phalaris tuberosa on the other hand is persisting well, and is the only perennial grass that so far has proved itself suitable for sown permanent pastures under these conditions of soil and climate.

SUBTERRANEAN CLOVER.

The grazing results of general fields of the Farm, outside the purely experimental areas have been recorded. Those established with Subterranean Clover have been grouped together, and Table 25 shows the results for the past 11 seasons:—

TABLE 25.—*Subterranean Clover Grazing, Kybybolite,* 1924-35.

Season.	No. of Fields.	Area.	Total Feed Days.	Sheep per Acre.
		Acres.		
1924–25........................	1	29·50	29,469	2·74
1925–26........................	3	109·00	100,794	2·53
1926–27........................	5	181·50	141,041	2·13
1927–28........................	6	231·80	208,635	2·47
1928–29........................	7	267·66	234,378	2·40
1929–30........................	7	263·71	220,071	2·29
1930–31........................	5	155·70	138,417	2·44
1931–32........................	7	237·40	238,[illegible]34	2·74
1932–33........................	6	181·26	181,900	2·75
1933–34........................	8	205·62	210,492	2·80
1934–35........................	12	288·58	321,279	3·05
Total		2,151·73	2,024,710	2·58

Fields from which meadow ensilage and hay have been cut have not been included in the above table, and the results do not represent the full grazing capacity, as it has not been practical to graze all fields completely. The return this season of 3.05 sheep per acre is the best so far recorded, an increase of ¼ sheep on the previous season. The average for 11 seasons of clover grazing shows at 2.58 sheep per acre per annum. The fields have not been top dressed regularly of recent years, but have averaged approximately 85lbs. superphosphate per acre per annum.

TOPDRESSING OLD CULTIVATED LAND.

Certain fields have been used for crop cultivation periodically, and left out for grazing during intervening seasons. Those top dressed with superphosphate, but not sown with grasses or clovers, have been grouped together, and their grazing returns for the past 10 years are given in Table 26:—

TABLE 26.—*Grazing of Top Dressed Cultivated Land, Kybybolite,* 1925-35.

Season.	No. of Fields.	Area.	Total Feed Days.	Sheep per Acre.
		Acres.		
1925-26	1	50·00	30,097	1·65
1926-27	4	140·47	68,764	1·34
1927-28	3	102·47	76,196	2·04
1928-29	3	121·07	102,089	2·31
1929-30	4	151·83	144,242	2·60
1930-31	4	151·83	134,629	2·43
1931-32	4	151·83	123,491	2·22
1932-33	3	93·38	83,588	2·45
1933-34	2	76·31	93,827	3·37
1934-35	2	36·47	27,061	2·03
Total		1,075·66	883,984	2·25

Similar land left out of cultivation but not top dressed has, during the past seven seasons, carried 1.35 sheep per acre, nearly 1 sheep per acre less than that which has been top dressed.

As a comparison to the above table the following two tables are included to show the grazing received from similar land that has never been cultivated. Table 27 shows the combined results of all such land that has been top dressed, whilst Table 28 shows the results from unimproved natural land, that is, land that has neither been cultivated nor top dressed:—

TABLE 27.—*Grazing of Top Dressed Natural Pasture, Kybybolite,* 1921-35.

Season.	No. of Plots.	Area.	Total Feed Days.	Sheep per Acre.
		Acres.		
1921-22	5	17·5	9,971	1·56
1922-23	5	17·5	9,458	1·48
1923-24	5	17·5	10,949	1·71
1924-25	6	21·0	21,859	2·85
1925-26	8	31·0	18,874	1·67
1926-27	11	43·0	28,948	1·84
1927-28	11	43·0	29,765	1·90
1928-29	11	43·0	38,880	2·48
1929-30	12	46·5	35,261	2·08
1930-31	12	46·5	47,900	2·82
1931-32	12	46·5	49,791	2·93
1932-33	12	46·5	52,721	3·11
1933-34	11	43·0	49,235	3·14
1934-35	11	43·0	59,473	3·79
Total		505·5	463,085	2·51

TABLE 28.—*Grazing of Unimproved Natural Pasture, Kybybolite,* 1921-35.

Season.	No. of Plots.	Area.	Total Feed Days.	Sheep per Acre.
		Acres.		
1921-22	2	116·5	33,324	0·78
1922-23	2	116·5	28,180	0·66
1923-24	2	116·5	17,343	0·41
1924-25	2	116·5	28,431	0·67
1925-26	3	88·5	23,711	0·73
1926-27	3	61·5	15,725	0·70
1927-28	3	44·5	16,887	1·04
1928-29	2	8·5	1,912	0·62
1929-30	5	19·0	5,407	0·78
1930-31	5	19·18	6,291	0·90
1931-32	4	15·68	5,392	0·94
1932-33	4	15·68	5,000	0·87
1933-34	2	8·5	2,687	0·87
1934-35	2	8·5	2,945	0·95
Total		755·54	193,235	0·70

The results from Tables 25 to 28 show what a large improvement in grazing capacity can be obtained on these lands. Just by ordinary general methods, land of a carrying capacity of 0.70 (Table 28) sheep per acre has been increased 370 per cent. to 2.58 sheep under Subterranean Clover (Table 25). From the results of experiments, given in earlier part of this report, where the grazing has been more complete and controlled 3.45 (Table 8) sheep per acre have been carried over a 10-year period on similar soil conditions, growing Subterranean Clover and Wimmera Rye Grass. This latter shows approximately 500 per cent. improvement.

TRIALS OF GRASS AND HERBAGE STRAINS.

The work of strain testing, assisted by the grant made by the Australian Dairy Council, and commenced in 1932 is proceeding steadily.

Some definite result in improvement in strains of Wimmera Rye Grass is well in hand; several good productive ones have been isolated, and will this season be planted out under field conditions, whilst the work of further selection and test will be maintained on small plots.

Also two strains of *Phalaris tuberosa* have been isolated, and it is also anticipated to be able to transplant a line of typically good persistent plants of Perennial Rye Grass this year from the 200 noted individual plants that have been growing under field conditions during the past three seasons.

In conclusion I wish to record the valuable assistance given by the staff of the Farm throughout the season, and especially the work of Farm Assistant Mr. J. D. McAuliffe, who has assisted materially with pasture estimations, checking, and preparation of this report.

ACTIVITIES AT ROSEWORTHY AGRICULTURAL COLLEGE, 1934-35.

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PART IV.—CEREAL BREEDING, EXPERIMENTS AND PURE SEED PRODUCTION.

For many years now the College has been engaged in wheat breeding and experimental work with cereals. Those conversant with the agriculture of the State realise the importance of the work already performed in this field. At the present time a College bred variety, Sword, is forging its way into popularity; in 1932 this variety was not even in the first twelve of the most important varieties grown in point of acreage, in 1933 it was eighth on the list and in 1934, fourth. Then again Ford, another College bred wheat, is gaining in favour, because of its baking quality; this variety is achieving greatness in New South Wales where its all round value has been appreciated by the farmer to the extent of making it the second most popular variety grown in that State. Ford is now fourth on the list of the leading varieties grown in Australia.

Apart from the breeding of new varieties, pure seed production plays a very important part in the efficiency of wheat growing in any State and it is an aspect that cannot be neglected. The work involved in keeping varieties true to type and propagating the right strains of pure seed can only be done systematically at an institution such as the College. Superimposed on the plant breeding and pure seed production functions of the College is the experimental work connected with all phases of the agriculture carried out on the farm. At such a centre, where practical leadership in agriculture is expected, experiments must of necessity be conceded a very important place in the field work, for without experimenting, thought and ideas never mature beyond the boring stage of hypothesis.

All these phases of development and investigation undertaken by the College vitally affect the wheat industry of the State, and whatever may be imagined to the contrary, it is safe to maintain that they could not be neglected without seriously jeopardising the prestige and efficiency of the South Australian farmer. The work in question demands great care, attention to detail, extensive record keeping and a superabundance of labour. Fortunately students supply the labour required and if this were not so the cost of such work would be very materially increased. On the present basis, students benefit considerably by constant and detailed contact with the work and in return their labour makes it possible. The same amount of hand seeding, "rogueing" and hand harvesting carried out with labour at basic wage rates would increase enormously the costs to the State. While the students enjoy the educational advantages the system offers and gladly respond with their labour, it is possible to keep such costs at a minimum. Not the least pleasing feature of this symbiotic relationship is that full confidence and trust in the students to do the work conscientiously, with full regard to its importance, is met by them with a response that assures extreme care and efficiency.

It is proposed in this part of the report to outline the cereal work that is being attempted along the lines indicated above. Detailed results will be made available as experimental results become more conclusive; this resumé of the work is merely an attempt to keep the primary producer and others concerned interested in important developments which take place from year to year.

CEREAL BREEDING.

In the past few years the whole of the wheat, oats and barley breeding work has received careful and thorough revision. Detailed accounts covering the objectives, the manner and means of attainment, and the nature of the revision deemed necessary to bring all procedure into line with modern knowledge and requirements, have been published in previous issues of the *Journel* (July, 1933, and August, 1934). Moreover in a previous section of this report (Part III.) the methods adopted for breeding for improved baking quality in wheat have been outlined and the extent of this phase of the work being conducted at the College has been described at length. In this connection although breeding for baking quality necessitates the use of slightly different methods to those commonly employed for the breeding for other desirable characters, the same fundaments apply.

A full account of the conditions prevailing throughout the season has been given in Part II. of this report. The specialised work under review was probably more deeply affected by the lack of rain at the beginning of the season than is reflected by the farm yields. The plant breeding plots never fully recovered from the malting of a considerable amount of grain, and the ravages of birds, especially innocent and unsuspected magpies. In addition, the relatively vigorous early growth of weeds had a deleterious effect upon yields in the plots. However, the progress of the work was in no way delayed and in some respects the season was a particularly valuable one.

The dry opening enabled valuable observations to be made on drought resistance in the cross-bred material, and it is significant to note that distinct variation was obvious even in the early stages of growth. It is very probable that resistance to dry conditions between seeding and flowering is equally important as resistance to dry conditions after flowering, the latter resistance, in fact, is very largely dependent upon the resistance to drought in the early stages. This supposition is based upon observation, for it was noticed that certain crossbreds, particularly those from the parent Egyptian 4, which were healthy and vigorous throughout the dry winter, maintained their superiority over those which staged a remarkable recovery after the August rains, following a comparatively dormant and unhealthy beginning.

OBJECTIVES OF WHEAT BREEDING IN RELATION TO BREEDING FOR QUALITY.

Comparative early maturity, drought resistance and general capacity for thrifty growth, coupled with good finishing characteristics remain the outstanding objectives of the wheat breeding programme, notwithstanding the fact that disease resistance and baking quality have also entered very largely into all the work. The latter two aspects have of late years become more important and consequently have been showered with publicity, especially breeding for better quality. If in the enthusiasm of outlining the work on quality, because of its immediate importance, there has been an overshadowing of the basic objectives, some correction is necessary. These remarks and those to follow on disease resistance are meant to allay any suspicion which may have arisen that the College was paying attention to the breeding of better quality wheats to the detriment of other objectives such as suitability to the environment, drought resistance, general early maturity, qualifying characteristics of agronomic value, and disease resistance. Probably there are more crossbred lines, incorporating these objectives, being tested annually than ever before in the College history, the quality programme is superimposed on this foundational work so that in point of fact nothing is being sacrificed in any way.

DISEASES.

In this year's report some more detailed information with respect to breeding for disease resistance is warranted, and each disease will be treated separately.

Flagsmut.—**During the season under review flagsmut was very prevalent in the breeding rows.** Where susceptible strains were inoculated with spores of the disease (*Urocystis tritici*), excellent infection was obtained, frequently as high as 100 per cent. Such heavy infection in susceptible lines increases the significance of non-infection in other lines, thereby strengthening their claim to complete resistance. Two years observations have shown that among advanced crossbred lines there are some which possess either immunity or a very high order of resistance to flagsmut; these, and many hundreds of lines in the third generation are being tested, per medium of inoculation, for flagsmut resistance, during the present season.

There are several quite good varieties of agronomic value which possess resistance to flagsmut. This fact simplifies the work and the task is not an insuperable one provided a judicious choice of parents is made. There can be no doubt that resistance to flagsmut is a quality to be desired; in fact the rapid widespread use of Nabawa throughout Australia was brought about chiefly because of its great character of resistance to this disease.

Stem Rust.—Towards the close of last season, stem rust (*Puccinia graminis tritici*) was so severe in the hand plots that selection for resistance to this disease was possible. Segregation for resistance was very marked in crosses containing the high quality and disease resistant variety Hope and to a lesser extent in all Ford crosses.

Although the average farmer is fully cognisant of the damage caused by stem rust, the disease receives publicity only once in every several years, since epidemics are relatively rare in this State. When they do occur, however, the effect is rather disastrous.

Breeding for rust resistance presents more difficulties to the plant breeder than does breeding for flagsmut resistance. Firstly, varieties possessing a combination of rust resistance and high yielding ability are rare. Ford is a notable example but even this variety shows an abundance of rust lesions on the stem though the grain sample is not seriously affected. The difficulty in selecting plants from Ford crosses in the field is obvious; the epidemic must be severe, and the grain of the plant must be examined before the plant breeder can determine whether it possesses true resistance..

There are a number of varieties which are immune or very highly resistant to stem rust. Unfortunately these are nearly all unsuitable for Australian conditions and moreover, they have red grain In any population parented by a red and a white grained wheat, the vast majority of the plants possesses red grain and selecting the white grained segregates from such populations is very laborious. This has been done, however, in a number of crosses made between red grained, rust resistant varieties and commercial white grained Australian varieties, in an endeavour to evolve a rust resistant, white grained type, which will be valuable for crossbreeding purposes, if not commercially.

The second difficulty encountered in a rust breeding programme is that an epidemic is required every year to render possible the selection of rust resistant plants. During the current season artificial means of inducing rust will be resorted to in an endeavour to save time and prevent the continuance of lines which may ultimately succumb to the ravages of the disease. The bird proof enclosure is being used for this purpose. A few grains of most lines, which on the basis of their parentage, might be resistant to stem rust, are sown within this enclosure, rows of a susceptible variety being sown at intervals amongst the lines. Soon after flowering the susceptible variety, which is seeded earlier than the crossbred lines, is inoculated with the disease. This is done by injecting a suspension of rust spores into the stems by means of a hypodermic needle. The northern and western sides of the enclosure are protected from the hot dry winds and by using a sprinkler during the late spring, suitable conditions of humidity will be created and the rust on the susceptible variety should soon attack the susceptible crossbred lines. In the hand plots, selection will be restricted to those lines which showed some resistance to stem rust under the artificial conditions. It is obvious that such an arrangement will greatly enhance the prospects of breeding rust-resistant varieties.

Leaf Rust.—Leaf rust or spring rust (*Puccinia triticina*) is nearly always present under College conditions but it cannot be considered a serious disease. Observations are made, however, on its occurrence in crossbred material. Although seldom serious, epidemics are common, which makes easier the task of selecting resistant types, but as with the stem rust work, the main difficulty is that breeding material possessing the combination of resistance and yielding ability, is rare.

Bunt.—Owing to the dry conditions of seeding, bunt (*Tilletia tritici*) was also prevalent in the hand plots. Lines of all crosses which contain a bunt resistant parent are inoculated with bunt spores before seeding and observations made on the susceptibility of each line. While resistance to bunt is considered desirable and the plant breeder looks to it as an objective, it is not absolutely essential, for the pickling of seed wheat is now almost universally practised throughout the State and is quite effective in checking the disease.

Loose Smut.—The control of loose smut (*Ustilago tritici*) is more difficult and resistant varieties are greatly to be desired. Unfortunately, however, there are only a very limited number of varieties which are resistant to this disease and none possesses desirable agronomic characters, hence their value for cross breeding work is problematical. Moreover, testing for loose smut resistance entails a great deal of time and labour. In view of these considerations the more important objectives receive priority and at present it is not proposed to embark on a definite loose-smut breeding programme. Efforts to combat the disease will be confined to the raising of pure seed free from loose smut and observations on resistance of crossbred lines whenever the disease makes its somewhat sporadic appearance.

Take-All.—Although a very important disease, Take-All (*Ophiobolus graminis*) has received little attention from the wheat breeder. The reason for this is that to date, no variety has been discovered which is resistant to the disease. For some years at least, therefore, the wheat farmer must not look to the plant-breeder for relief, but must rely upon recommended cultural methods to combat the ravages of "Take-All".

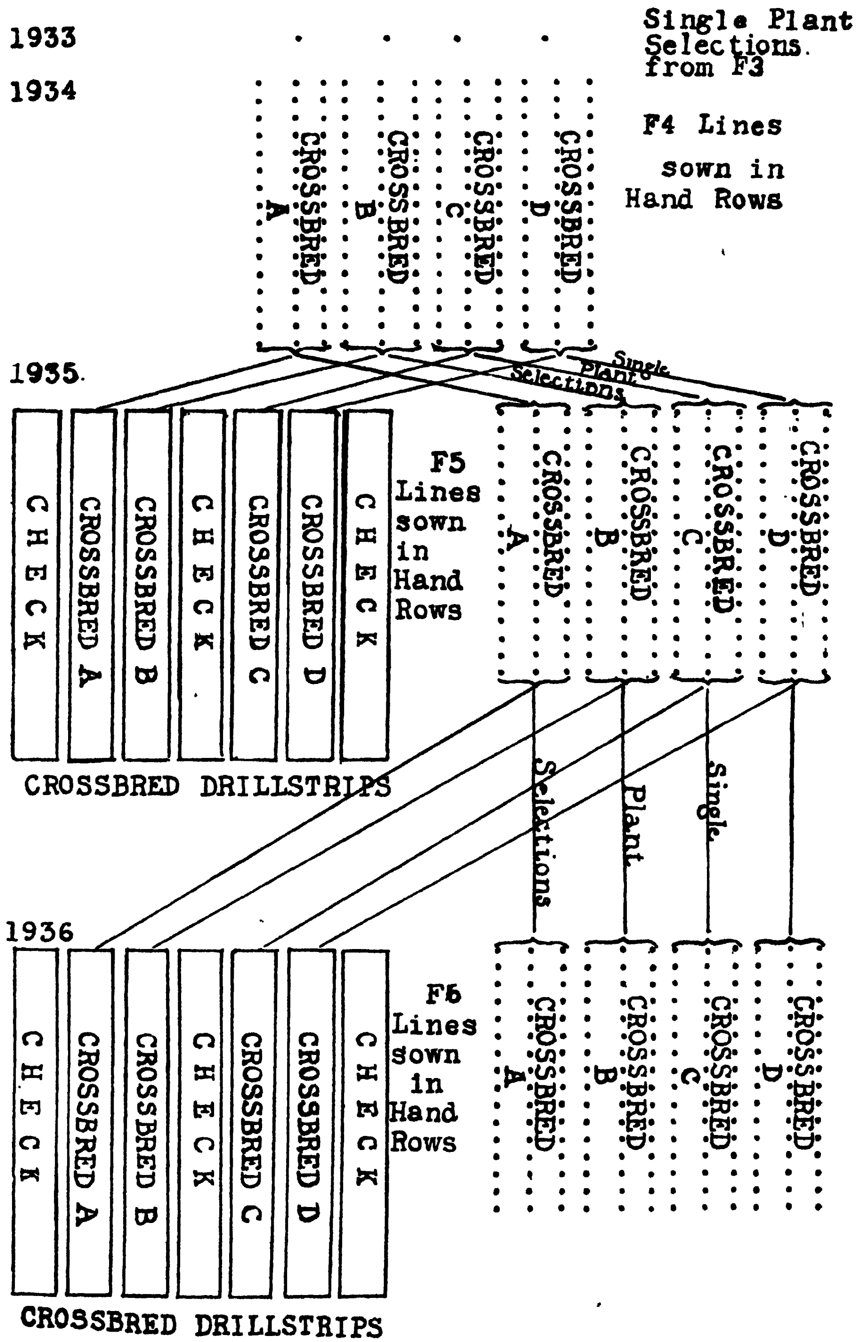
Septoria.—The damage caused by the Septoria leaf spot (*Septoria tritici*) has never been determined but it is unlikely that it will assume proportions sufficiently serious to warrant the intensive attention of the wheat breeder.

CROSSBRED DRILL STRIPS.

A recent innovation in the plant breeding work, which was tested for the first time in the 1934 season, was the growing of crossbred drill strips. Promising lines in advanced generations from the hand plots were sown through the drill in strips four hoes wide and one chain long. Every third strip was sown with a standard variety of repute for comparative purposes. This system serves as a preliminary yield trial for crossbred material; moreover the field behaviour of the different lines can be observed—an important consideration since this is quite often different from plot behaviour. Single plant selections of each line growing in the drill strips are sown in rows in the hand plots and further selection is restricted to these rows, the bulk seed from the rows will in turn sow the drill strips the following season.

The system of sowing drill strips should have the effect of speeding up the breeding programmes in so far that the fixation of the lines proceeds as usual but, in addition, by the time they are fixed, a reasonably accurate impression of their field behaviour will have been obtained, permitting a reduction in the time taken for normal field tests of fixed crossbreds. Moreover it will be possible to conduct baking tests in relatively early generations.

System of Testing Crossbred Lines.



Diagrammatic Representation of System of Testing in Crossbred Drillstrips.

It is proposed, in the future, to carry out a certain amount of extension work from the College in connection with wheat breeding, and in this scheme drill strips of the type described above will be sown on farmers' properties in different centres of the State. The adaptability of promising crossbred lines to the various environmental conditions of the State will thus be determined in the early stages of the work, thereby greatly facilitating the selection of lines suitable to the different districts.

INTRODUCTIONS.

A number of varieties were introduced from sources outside the State during the year and some of these, on one year's performance have shown promise both directly for their yielding ability and indirectly for their potentialities as parents for crossbreeding purposes. Recent introductions from Canada possess not only immunity to stem rust but also to flagsmut and leaf rust. Moreover they are much better agronomic types than other disease resistant varieties available in the past, although they have red grain. Three varieties from Kenya Colony which are white grained and have very fair agronomic characters show a high order of resistance to stem rust and flagsmut; these should be particularly valuable in the crossbreeding work. Other introductions looked promising on one year's performance but it would be premature to attempt to forecast their future utility.

OAT BREEDING AND INVESTIGATIONS.

In the past, farmers of South Australia have had to rely mainly on oaten varieties introduced from New South Wales, where conditions and soils are vastly different from those in this State.

A definite oat breding programme has therefore been embarked upon in an endeavour to evolve an oat which will be particularly suited for our Mallee soils. The primary objectives are early maturity and yielding potentiality combined with the power of recovering after grazing.

At present, systematic hay, grain and grazing trials are being conducted at the College and some valuable data concerning the relative merits and demerits of the various varieties have been collected therefrom. Selections have been made from some of the more common varieties such as New Zealand Cape, Early Kherson, Algerian and Sunrise and some of these look very promising. They will be subjected to yield trials during the next season.

BARLEY BREEDING.

The cultivation of barley for malting purposes is not likely to expand to any extent in the near future and it is sufficient to meet the dictates of the moment. Breeding for improved malting quality is difficult, for the plant breeder has no medium for the selection of this character except that of the eye. Early maturity is an essential in a malting barley suitable for South Australian conditions and it is highly probable that late maturity and high malting quality are linked—more in a physical than in a genetical sense. Efforts are being made, however, to combine the high malting quality of varieties such as Spratt Archer, Plumage Archer and Beavan's Special with the more prolific and earlier maturing Prior; lines of such crosses are now in advanced generations.

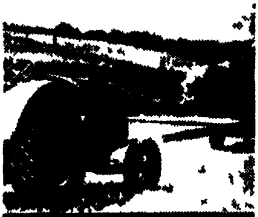
In the six-row types, prolificacy is the main essential but crosses have also been made between these types and Prior in an endeavour to produce a six-row barley with fair malting quality for overseas requirements.

Varietal investigations with barley are being conducted and some promising six-row types are now being tested in the field trials.

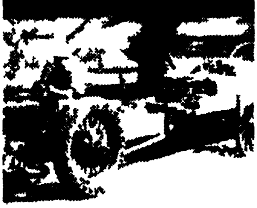
PURE SEED PRODUCTION.

The method used at the College in the propagation of pure seed of existent varieties, based on the foundation of single plant selection and multiplication therefrom, was outlined in an article published in the *Journal* for July, 1933.

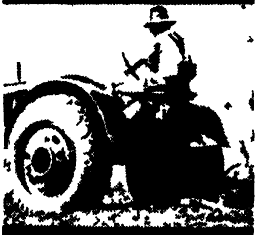
HARVESTING



BELT WORK



HAULING



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This scheme is now in full operation. Sales of pure seed have increased considerably over the past two years clearly illustrating that the farmer is appreciative of seed true to type, free from loose smut and barley. Last year there was a particularly heavy demand for Sword, Ford, Ranee 4H and Dundee. The varieties Early Gluyas and King's White were popular and there were limited demands for Waratah, Sultan, Baringa, Nawab, Nabawa, and Huguenot.

The demand was greater than the supply, especially in some varieties, but by insisting on farmers only being allotted small lots of a few bags each, a wide and equal distribution of good seed was possible. Actually the College is not anxious to fill big orders of one variety for any one client, as the main object is to supply the grower with pure seed which he can multiply and use for his own requirements, while ever it remains free from admixture and is otherwise satisfactory. When he considers it necessary to renew his line a fresh start should be made from the pure seed lines at College; these lines are actually maintained for the farmer and it is hoped that at all times full advantage of the work will be taken.

From the varieties Sword and Ford, which have shown considerable variation, a number of strains have been fixed. These are now being tested for yield but will not be available for distribution for some time yet. For the present, a relatively pure commercial strain of Sword being grown at the College is giving good results; this strain is practically free from the "brown-head" and the purple straw type commonly found in Sword. Likewise, a reliable and typical strain of Ford, which should satisfy requirements for the next two or three years, is available to farmers.

A large seeding has been made this year of varieties of oats, for indications suggest that the demand will be heavy. For the 1935 seeding, farmers made numerous inquiries for an early grazing oat which would recover quickly to give a satisfactory harvest of hay and grain. For the present Early Kherson is to be recommended in this respect and ample provision for seed of this variety has been made.

The College will be in a better position to advise on the suitability of particular oaten varieties when more detailed field trials have been conducted. Meanwhile, New Zealand Cape and Algerian are recommended for early and Early Kherson for later sowing.

CEREAL VARIETY TRIALS.

Method.—All variety trials are conducted on a replicated system of randomised plots. The idea is to satisfy practical as well as scientific requirements.

For *practical* purposes the plots are about 5ft. 9in. wide, or 9 drill hoe widths, and are 3.19 chains in length. Each plot is thus 1/40th of an acre and can be handled quite conveniently with the use of an ordinary drill and stripper.

Replications are necessary to make sure that the differences being measured are differences between the varieties and not differences due to other factors such as soil variation. This also enables a *scientific* interpretation of the results to be made, enabling the actual significance of the results to be assessed.*

The standard error (S.E.) aimed at in trials of this nature is 2 per cent. Those obtained from last season's experiments were all larger than this, but with the exception of the Mid-season Wheat yield trial, which was badly checked by weeds, all experiments must be considered as very satisfactory, since the S.E. is lower than 3 per cent. In a normal year a 2 per cent. error should be attained without much difficulty.

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*Fisher's Analysis of Variance was applied to all the results obtained from the replicated trials. All experiments in 1934 were found to be very significant (P = 1 per cent) by the Z method.

In the discussion of results, only the S.E. and the significant differences will be shown. In interpreting the results, only those differences which are equal to or greater than the significant difference quoted for the experiment should be given credence. In other words the margin of error signifying a real difference due to the variety itself is stated by the significant difference.

Late Wheat Variety Trial.—The results of this trial are set out in the accompanying table. The conclusions that can be inferred from these results are that Ford Selection and Baringa are approximately equal and both, for the season of the trial, were significantly superior to the rest of the varieties tested. On the other hand there was no difference between Free Gallipoli and Ford, as the difference recorded is not a significant one; in other words under identical conditions it is probable that the two varieties would give practically equal results. Dundee in these results has given a significantly superior yield to both Free Gallipoli and Ford.

ROSEWORTHY AGRICULTURAL COLLEGE.

RESULTS OF WHEAT VARIETY TRIALS, 1934.

Late Maturing Varieties.

Variety.	Yield per Acre. bush.	Yield per Acre. lbs.	Percentage Yield.
Ford Selection	**30**	**28**	**116**
Baringa	**30**	**12**	**115**
Dundee	**28**	**44**	**109**
Free Gallipoli	27	16	104
Ford (standard)	26	20	100

S.E. = 2.6 %. Significant Difference = 88lbs. per acre.
Significant results in comparison with the standard *Ford* are in block type.

Ford Selection in this trial has again shown its ability to yield well; in addition it is a useful hay variety. On the other hand it is later than Ford and lacks the rust resistance of that variety; it will be necessary, therefore, for it to show substantial superiority in yield over a number of years before it would be wise to recommend it.

Baringa filled its grain exceptionally well and in view of the fact that millers show a slight preference for this variety it is possible that it may have some future in South Australia. One characteristic is that it holds its grain tightly and is sometimes difficult to thresh, but under the average of South Australian conditions this feature of Baringa should not be very serious. It is essentially a grain wheat and will not yield well for hay.

Dundee did not yield up to its appearance but its superiority to Ford last season indicates that it is well worth a trial in South Australia, particularly in the more favoured districts. Its outstanding characters are its good baking quality, strong straw and flagsmut resistance. It is, however, very susceptible to stem rust.

It has been demonstrated once again that *Free Gallipoli* is not a high yielding variety on the drier Mallee soils and in view of its very poor baking quality farmers are strongly urged to test some of the better quality varieties which are available and which are capable of replacing quite adequately the notoriously low quality Free Gallipoli.

Mid-Season Wheat Variety Trial.—In the results tabulated, Nawab is shown to be outstanding and has given a yield placing it above all the other varieties in the trial. The three varieties Sultan, Bobin, and Nabawa in this trial have given equal results as there is no significant difference between them, but all three are inferior to Nawab, and all three have given significantly better results than either Ranee 4H or S.H.J. The variety Minflor has given a significantly inferior yield to all varieties in the trial.

ROSEWORTHY AGRICULTURAL COLLEGE.

RESULTS OF WHEAT VARIETY TRIALS, 1934.

Mid-Season Maturing Varieties.

Variety.	Yield per Acre. bush.	 lbs.	Percentage Yield.
Nawab	**27**	**28**	**122**
Sultan	24	4	108
Bobin	22	28	101
Nabawa (standard)	22	16	100
Ranee 4H	**18**	**56**	**85**
S.H.J.	**18**	**16**	**82**
Minflor	**13**	**0**	**55**

S.E. = 5.3 %. Significant Difference = 136lbs. per acre.

Significant results in comparison with the standard *Nabawa* are in block type.

General View of the Wheat Breeding and Experimental Plots prior to Harvest, 1934.

Nawab was outstanding and over the last six years this variety has outyielded all other varieties grown at the College; its claims, therefore, can no longer be ignored, particularly in the Lower North districts where a dual purpose wheat is desired. Unfortunately it is susceptible to most diseases but its inherent yielding ability compensates in large measure for losses from these causes in most seasons. Its baking quality is quite fair and taking this and its performance in the field into consideration, it can be recommended to farmers for growth on the better Mallee soils, especially where a dual purpose variety is required.

The yield of the newcomer *Bobin* (introduced from N.S.W.) was satisfactory but it has no outstanding characters to warrant its continuance under our conditions.

Ranee 4H in this trial was disappointing. In this group there was strong competition from weeds during the winter months, which appeared to have greater effect on the Ranee than other varieties.

The high quality wheats *S.H.J.* and *Minflor* were failures in comparison with the standard Nabawa, and will be rejected on the score of poor yields.

Early Wheat Variety Trial.—In the trial of early maturing varieties, Merredin and Sword are at the top of the results and both give significantly better yields than any of the other varieties. B.F.G. 3003 is also superior to the standard variety of the trial, Waratah, as is Aussie, but Minflos has given a yield significantly inferior to all varieties.

ROSEWORTHY AGRICULTURAL COLLEGE.

RESULTS OF WHEAT VARIETY TRIALS, 1934.

Early Maturing Varieties.

Variety.	Yield per Acre.		Percentage Yield.
	bush.	lbs.	
Merredin	**21**	**36**	**122**
Sword	**20**	**4**	**114**
B.F.G. 3003	**19**	**4**	**108**
Aussie	**18**	**48**	**106**
Florence	18	4	102
Waratah (standard)	17	40	100
Minflos	**15**	**36**	**88**

S.E. = 2.4 %. Significant Difference = 56lbs. per acre.

Significant results in comparison with the standard *Waratah* are in block type.

Merredin on its first appearance in the field trials at the College, outyielded the reliable *Sword.* It is interesting to note the superiority of Merredin to *Aussie.* The general opinion is that these two varieties are synonymous but slight agronomic differences do exist apart from the difference in yielding potentialities, though the latter may have been affected slightly by the fact that the seed of the two varieties came from widely different sources.

B.F.G. 3003, a promising Queensland introduction, gave a creditable performance and will be tested further.

Waratah was disappointing and in view of its poor baking quality is no longer recommended.

Florence gave fair results and must still be recommended for late seeding particularly as millers are paying a premium for the variety.

Minflos was a failure in the trial.

Yield trials were also conducted with *Gluyas* and *Sword* strains, the results of which are of no interest outside the College. An outcome of the trial with the strains of Gluyas is that the College has adopted the selection Gluyas 32-40, from the Waite Institute, as the standard and pure seed of this strain will be distributed to farmers in the future.

Barley Variety Trials.—Two small yields were conducted with varieties of barley, the results from which are given below:—

ROSEWORTHY AGRICULTURAL COLLEGE.

RESULTS OF BARLEY VARIETY TRIALS, 1934.

(*a*) *Six-Rowed Varieties.*

Variety.	Yield per Acre.		Percentage Yield.
	bush.	lbs.	
Californian Cape (light)	31	34	103
Californian Cape (heavy)	31	18	102
Roseworthy Oregon (standard)	30	44	100
Prior x Roseworthy Oregon	**19**	**26**	**63**

Significant results in comparison with the standard *Roseworthy Oregon* are in block type.

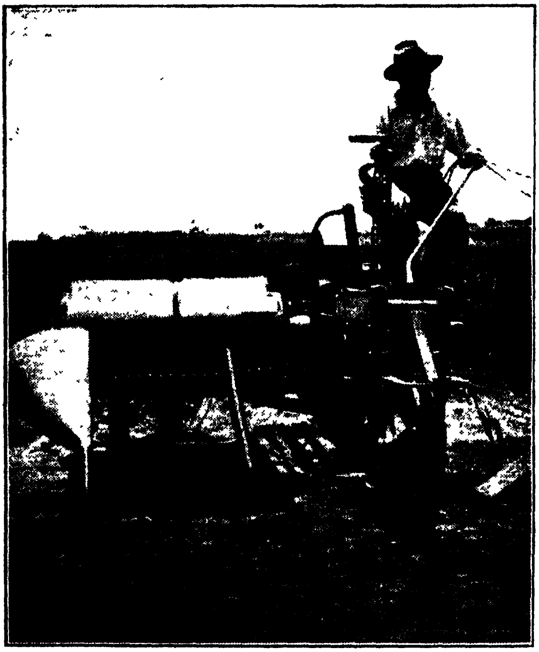
(*b*) *Malting Two-Rowed Varieties.*

Variety.	Yield per Acre.		Percentage Yield.
	bush.	lbs.	
Prior (standard)	40	5	100
Prior x Roseworthy Oregon	39	5	97
Prior Selection	39	5	97

S.E. = 2.45 %. Significant Difference = 74lbs. per acre.

Apart from the fact that it was demonstrated that the crossbred Prior x Roseworthy Oregon is inferior to the standard six-row types, no information of a positive nature was derived from the trials. Californian Heavy and Californian Light, for which there have been some inquiries, possess satisfactory yielding ability and there is some small demand for their grain for the export trade.

Oaten Trials.—Oat varieties for yield testing were sown on fallow and owing to excessive lodging the trial could not be harvested. Early Kherson was the only variety which did not lodge. In the future, oaten trials will either be sown on stubble or on fallow and grazed once. In the current season these trials have been considerably increased and include grazing, hay, and grain groups.



The Third Stage in producing Pure Seed of Wheat and other cereal varieties is the multiplication of seed from the hand plots by growing the produce in long stud rows. This small machine was constructed at the College for harvesting these long rows. It consists of a 3ft. comb, is worked with an auxiliary engine, and drawn by one horse. The machine also does all the stationary threshing of small lots harvested by hand from the breeding plots.

CULTURAL AND MANURIAL EXPERIMENTS.

Working on the basis that example is better than precept, the College experimental work is so designed as to test and demonstrate at the same time the relative worth of different methods or treatments. Actually, to lead the developmental work in all phases of local agriculture is essentially a function of the College, and where developments have taken place or are suggested, it becomes the duty of the College to test their worth.

The nature of the experiments being conducted at any such institution, their scope, aims and general practicability are reflections of the vitality and thought of the institution concerned. At Roseworthy College, the one common feature to all the experimental and investigational work is the emphasis given to the practical and utilitarian aspects. *All experiments are conducted on a practical basis, with practical objectives, yet they are all based on scientific principles to guarantee their accuracy. No manurial or cultivation treatment, weed control or system of fallowing which may be beyond the average farmer as regards means or plant, is either used or advocated.*

Apart from the increased number of variety trials, several new experiments have been initiated within the last two years. Some of these are of the nature of biennial experiments, requiring two years before one result is known. These and others demand repetition before any conclusions are justified, so that at the most, only preliminary reports on the progress being made are available for report herein.

CULTIVATION EXPERIMENTS.

The prevailing low prices for wheat and the growth of mixed farming has brought about a tendency to neglect thorough cultivation of fallows. In some cases the additional returns that might be expected do not offer sufficient incentive to cultivate at every favourable opportunity. Further, with the advent of mixed farming as an almost universal practice, sheep are being used to such purpose in many instances as to take the place of the cultivator. Unwittingly the farmer is probably losing by this partial neglect. With high returns from wool and lambs, enthusiasm for wheat farming as such has waned, and efforts to secure maximum yields from wheat crops are not being made, even though in many cases extra efforts would prove profitable.

In an endeavour to determine the actual value of well prepared fallow in comparison with poorly prepared fallow, a cultivation experiment was commenced at the College in 1933. Incidentally, the experiment was designed so that some measure of the economic worth of each cultivation could be made, and the most important cultivations defined.

The experiments were conducted under field conditions; the plots being marked off in an ordinary fallow paddock. Eight different treatments were allowed for and each treatment was replicated five times. All treatments received the initial and the pre-seeding cultivation, some missed one cultivation at different times of the year, others missed two such cultivations and one series missed three cultivations. The plots were each 1/20th acre.

The experiments were conducted on two classes of soil, a red sandy loam (Dalys B), a light limestone rubble (No. 16). The results are given in the following table:—

ROSEWORTHY AGRICULTURAL COLLEGE.

Cultivation of Fallow Experiments.

Treatment.	I. Dalys B. (Sword). Results on Red Sandy Loam.	II. No. 16 (King's White). Results on Light Limestone Rubble.
	Bush. lbs.	Bush. lbs.
A. Routine fallow, five workings	30 10	26 38
B. Missed one cultivation in late summer	**28 28**	27 42
C. Missed one cultivation in autumn	**25 54**	**20 40**
D. Missed one cultivation in early summer	**25 58**	26 0
E. Missed two cultivations in i. early summer	**23 46**	**19 56**
ii. autumn	—	—
F. Missed two cultivations in i. late summer	**23 52**	**19 12**
ii. autumn	—	—
G. Missed two cultivations in i. early summer	**25 30**	25 4
ii. late summer	—	—
H. Missed three cultivations in i. early summer	**22 20**	**20 40**
ii. late summer	—	—
iii. autumn	—	—

I. Dalys B—(Sword) S.E. = 2.7 %. Significant Difference 84lbs. per acre.
II. No. 16—(Kings White) S.E. = 3.1 %. Significant Difference 96lbs. per acre.
Significant results in comparison with the standard of Routine fallow, five workings, are in block type.

The conclusions to be drawn from the results are that the routine fallow with five workings was significantly superior to all other treatments studied in Dalys B, and in all cases, the neglected fallows were significantly inferior to the rest. In the same paddock, Dalys B, the fallows which missed the autumn cultivations were in all cases inferior to the other preparations. The early summer cultivation was of significant importance as indicated by the results from treatment D which did not receive this cultivation, whereas it does not appear to have had the same importance when it was missed in association with another cultivation (treatment G) except that it is again significant when it is missed in association with the autumn cultivation (treatment E). The logical conclusion is that in 1934 the autumn cultivation was the most important and critical one carried out. The late summer cultivations appear to have had little effect on the yields, though the fallow that missed this one cultivation alone (treatment B) gave a significantly lower return than the routine treatment A.

The Stud Plot Stripper taking off a long row of Wheat. Note the cocky chaff blowing out at the back as the machine moves forward.

The results from No. 16 (Kings White) on light limestone rubble agree fairly closely with those from Dalys B in so far that missing the autumn cultivation was the cause of a significant decrease in yield. The difference in this case is much greater than in Dalys B and may be attributed to the earlier and more rapid weed growth on the lighter soil. In this case, also, the early summer cultivation is shown to be more important than the late summer cultivation.

A scrutiny of the yields obtained under the different treatments reveals some interesting information. Firstly it is noticed that the good fallow outyielded the neglected fallow by approximately 5bush. on the sandy loam and 6bush. on the rubble—a loss of approximately 15s. and 18s. per acre respectively on the basis that wheat is worth 3s. per bush. to the farmer. The cost of the three cultivations must be offset against the profit from the good fallow. This varies in different districts but taking everything into consideration it is estimated that each cultivation at the College costs approximately 1s. 6d. per acre. Thus the grazing value of the neglected fallow would have to be more than 10s. per acre if the loss in yield were to be compensated by the feed obtained from the extra weed growth.

Further analysis of the results shows that the autumn cultivation was all important in 1934, both on the sandy loam and on the rubble, irrespective of the number of times the land had been cultivated before the autumn. Neglect of the summer fallows was more important on the sandy loam than on the rubble, but it will be necessary to repeat the experiment for a number of years before definite conclusions can be formulated on the relative importance of the summer workings. There can be no doubt that results of this kind of experiment are very materially affected by conditions of soil and climate and it would be folly to suppose that the results obtained from experiments at the College are applicable in all cases. Actually they would only apply to areas of similar environmental conditions on the same class of mallee soil. This, however, does not detract from the value of such work, for it is being conducted to demonstrate, as forcibly as possible, the importance of good fallowing methods and to show that neglect of fallows in wheat growing means, in almost all cases, monetary loss.

TRIALS WITH SULPHATE OF AMMONIA.

During the last few years the value of sulphate of ammonia for stubble crops has been demonstrated under certain conditions. Generalisations from particular instances have led to the wider use of this fertiliser for stubble crops, but there are several factors which must be taken into consideration before the general use of such fertiliser can be advocated.

1. In the first place a much better response from nitrogenous fertilisers is to be expected in high rainfall districts than in districts where the rainfall is below 20in.

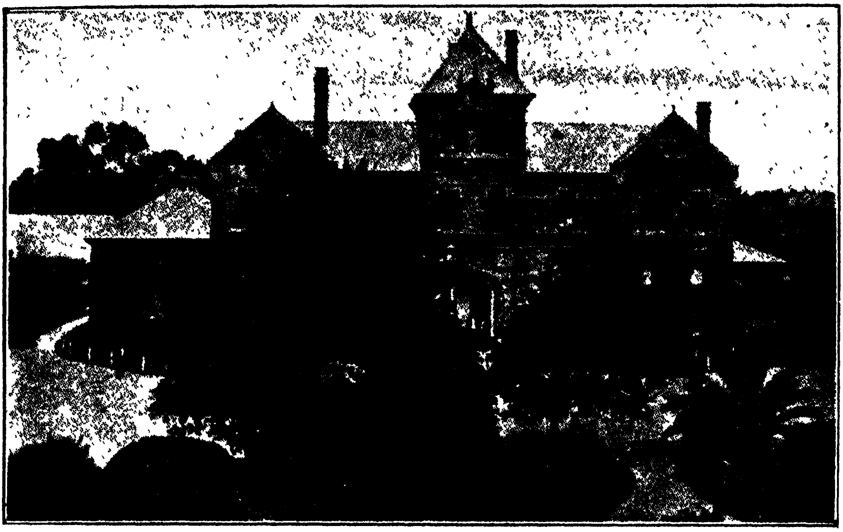
2. Secondly, nitrogenous fertilisers might quite conceivably increase the vegetative growth and handicap the crop from finishing and filling its grain well under short seasonal or poor finishing conditions; such conditions prevail as the rule rather than the exception in many cereal districts of the State.

3. Significantly increased returns may accrue but they may not be sufficient to cover the costs of the sulphate of ammonia.

4. On wheat land in good heart which has been farmed well on a wide rotational basis and liberally supplied with superphosphate a good cover of leguminous pasture can be expected when the paddock is rested as ley land. Under such conditions a payable response from nitrogenous fertilisers may not be obtained.

5. On wheat land which is being over-cropped and where quick returns are taken to be "the be all and end all" of the agriculture of the farm, sulphate of ammonia will likely give a payable response on stubble land.

6. Nitrogenous fertilisers have no beneficial residual effects as has superphosphate and unless the season is such that payable returns are possible, the application of sulphate of ammonia is lost.



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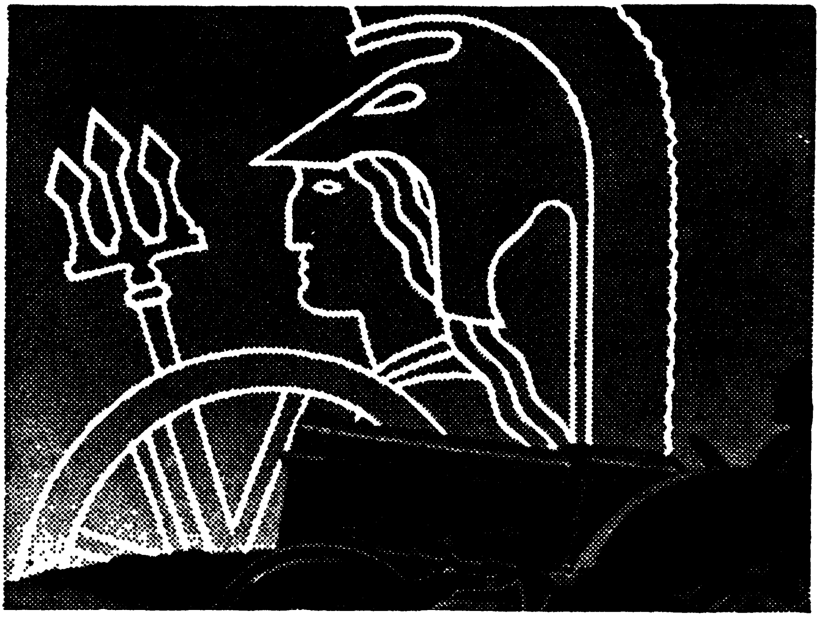

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7. More knowledge of the effect of sulphate of ammonia on the fertility level and physical condition of the soil is necessary before the unqualified use of the fertiliser can be advocated. It is necessary for farmers to think in terms of mixed farming rather than in hay or grain returns. It is quite conceivable that the drain on the fertility level of those soils upon which sulphate of ammonia gives positive results, might be seriously reflected in the subsequent pasture, even though the rate of application of superphosphate has not been reduced.

Results obtained at the College during the past two seasons substantiate the assertion that such points as the above should be given close and careful study before embarking on the regular use of sulphate of ammonia for stubble crops. The results obtained are tabulated below:—

ROSEWORTHY AGRICULTURAL COLLEGE.

TRIALS WITH SULPHATE OF AMMONIA ON STUBBLE CROP—PRIOR BARLEY.

Seasons 1933-34

Treatment per Acre.	Grain.		Hay.
	Yield per Acre, 1933.	Yield per Acre, 1934.	Yield per Acre, 1933.
	Bush. lbs.	Bush. lbs.	Tons cwt. lbs.
No manure	28 15	27 59	1 19 0
1cwt. Superphosphate	27 24	28 49	1 19 35
1cwt. Sulphate of Ammonia	25 44	28 10	2 0 82
1cwt. Super and ½cwt. Sulphate of Ammonia	26 33	31 32	2 0 41
1cwt. Super and 1cwt. Sulphate of Ammonia	21 42	30 57	1 18 75
1cwt. Super. and 1½cwt. Sulphate of Ammonia	18 19	—	1 15 102

1933.—S.E. = 5.6 % for grain. Significant Difference = 140lbs. per acre grain.
3.0 % for hay. Significant Difference = 264lbs. per acre hay.

1934.—S.E. = 2.3 %. Significant Difference = 81lbs. per acre.

EARLY KHERSON OATS.

Season 1933.

Treatment per Acre.	Grain. Yield per Acre.	Hay. Yield per Acre.
	Bush. lbs.	Tons cwt. lbs.
No manure	29 21	2 2 63
1cwt. Superphosphate	30 36	2 6 17
1cwt. Sulphate of Ammonia	33 25	2 10 15
1cwt. Super. and ½cwt. Sulphate Ammonia	36 2	2 14 39
1cwt. Super. and 1cwt. Sulphate Ammonia	35 29	2 15 60
1cwt. Super. and 1½cwt. Sulphate Ammonia	33 27	2 10 54

S.E. = 4.2 % for grain. Significant Difference = 112lbs. per acre for grain.
2.8 % for hay. Significant Difference = 320lbs. per acre for hay.

A perusal of the results from the trials clearly demonstrates that under College conditions the heavier dressings of sulphate of ammonia are uneconomical and in some instances have even caused a reduction in yield. This reduction is most marked in the grain yields of Prior barley in 1933. It will be remembered that the finish of this season was particularly severe and those plots which received dressings of sulphate of ammonia, produced a pinched sample of grain and a fluffy hay of low feeding value. This accentuates the emphasis which must be given factor 2 in the preliminary discussion on this subject.

A dressing of 1cwt. of super and ½cwt. of sulphate of ammonia gave significant increases over 1cwt. super only in oaten hay and grain in 1933 and for barley grain in 1934, and such increases may have been sufficient to show a small profit on the cost of treatments, but against this must be offset the definite loss on barley grain and hay in 1933.

It might also be pointed out that a dressing of 1cwt. superphosphate gave no significant increase in yield as compared with the unmanured plot, but this may be attributed to the residual superphosphate in the College paddocks. This is sufficiently high to support an unmanured crop on stubble land equally well as would a dressing of 1cwt. of superphosphate. It is highly probable, however, that the following crop on the unmanured plot would show a significant decrease in yield if superphosphate were not applied. The residual effect of a fertiliser is most important in its bearing on subsequent pastures. It is a well known fact that the residual effect of sulphate of ammonia is negligible—in fact it is probable that heavy dressings might have a deleterious effect of a similar nature to that of overcropping. The heavier vegetative growths which are obtained in some instances must add to the strain upon the fertility level of the soil. On the other hand, liberal dressings of superphosphate encourage a luscious mixture of legumes and pastures; once the legumes are established there is no need for nitrogenous fertilisers. This explains the results obtained at the College. *Owing to the regular use of superphosphate, pastures rich in legumes and with a high carrying capacity have been built up; consequently the general fertility level in the soil is higher in every respect and it is not to be wondered at that the application of sulphate of ammonia fails to produce those startling results which have been obtained on soils in not such good heart, which are virtually low in available as well as potential nitrogen.*

Before the use of sulphate of ammonia can be recommended for the major part of the wheat growing area of South Australia, extensive rotation experiments are required. It is futile to draw conclusions on one or two year's results from experiments in picked localities, particularly as results are generally presented in terms of grain or hay yield only, although it is conceded by the College that it may be quite possible that in the better class wheat soils, light dressings of sulphate of ammonia, in addition to the usual dressings of superphosphate might give a profitable return. Results at the College have shown that applications of heavy dressings of sulphate of ammonia are risky, particularly in those districts which are likely to be subjected to a severe finish.

It has been proved beyond doubt that the yielding ability and carrying capacity of the farm can be built up by the liberal use of superphosphate, livestock and judicious cropping and this is the policy which has been advocated by the College and will be advocated in the future unless, of course, later work and results can lend greater *agricultural significance* to the use of nitrogenous fertilisers on the stubble crops of the main wheat growing areas.

(*To be continued.*)

TOBACCO IN MURRAY IRRIGATION AREAS.

[R. E. C. GILES, Tobacco Instructor.]

Experimental tobacco plots around Barmera and Loveday show considerable improvement upon anything previously conducted in this area. Light Virginian types are being grown this season. Leaf curing operations will be conducted in the barns made available by the Department of Agriculture for this purpose.

Section of Mr H. Wilkinson's Experimental Plot at Loveday.

Section of Mr. T. R. Kerr's Experimental Plot at Barmera.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING MONTHS OF NOVEMBER AND DECEMBER, 1935.

IMPORTS.

Interstate.

	Nov.	Dec.
Apples (bushels)	72	21
Apricots (bushels)	—	4
Bananas (bushels)	19,355	18,190
Bananas (bunches)	—	20
Citrus—		
Grape Fruit (bushels)	162	120
Lemons (bushel)	1	—
Oranges (bushels)	181	1,127
Mangoes (bushels)	1	6
Passion Fruit (bushels)	76	281
Paw Paws (bushels)	7	3
Peaches (bushels)	—	3
Pineapples (bushels)	1,167	1,236½
Strawberries (bushels)	2	—
Tomatoes (bushel)	1	—
Nuts—		
Peanuts (bags)	108	184
Peanut kernels (bags)	32	11
Popple (bags)	2	2
Beans (bushels)	3	—
Cucumbers (bushels)	329	—
Onions (bags)	13	—

	Nov.	Dec.
Potatoes (bags)	13,047	7,328
Bulbs (packages)	37	24
Plants, ornamental (packages)	69	32
Roots, grass (package)	1	—
Seeds (packages)	58	29
Shrubs (packages)	2	—
Tubers (packages)	1	1
Wine casks (No.)	3,803	1,854
Fumigated—		
Citrus—		
Grape Fruit (bushels)	161	80
Oranges (bushels)	—	300
Wine casks (No.)	24	38
Rejected—		
Apples (bushels)	—	2
Bananas (bushels)	271½	62
Pineapples (bushels)	6	3
Tomatoes (bushel)	1	—
Plants (package)	—	1
Secondhand cases (No.)	62	—

Overseas.

(State Law.)

	Nov.	Dec.
Wine casks (No.)	1,906	1,654
Fumigated—Wine casks (No.)	33	52

Federal Quarantine Act.

	November.		December.	
	Packages.	Lbs.	Packages.	Lbs.
Seeds, &c.	12,577	1,101,130	7,660	1,536,210
		(No.)		(No.)
Plants	2	124	14	16
Canes	221	—	251	—
Chests, cocoanut	396	—	298	—
Chests, tea	1,163	—	1,229	—
Handles	255	—	250	—
Timber	326,852	15,052,500 sup. ft.	138,106	4,209,280 sup. ft.

EXPORTS.

Federal Commerce Act.

		Nov. Pkgs.	Dec. Pkgs.
Netherlands, East Indies	Cherries	—	26
	Peaches	—	4
	Plums	—	4
	*Vegetables	—	4
New Zealand	Clover seed	21	40

		Nov. Pkgs.	Dec. Pkgs.
Singapore	Cherries	—	30
	Gooseberries	—	7
	Plums	—	10
	*Vegetables	—	25
Straits Settlements	*Vegetables	—	5

* Potatoes excluded.

The stem above ground bears only a single produced leaf, devoid of cormils in its axil, above which it becomes continuous with the slender axis of the inflorescence. The stem is often flexuose and bears but one or two branches. Flower clusters are relatively few in number and situated towards the ends of the stem and its branches. The flowers are at first enclosed within the spathe leaves and later emerge and open. Usually only a single flower is open at a time, the size being almost double that of the flower of *H. miniata.*

Means of Spreading.—Both species of Cape Tulip have a wide distribution in this State, and while both are equally injurious to stock, it is uncertain which of the two is to be considered the more serious as a weed. Owing to the production of cormils the Two-leaved Tulip would seem to be the more difficult to get rid of when once firmly established, but it does not appear to spread as rapidly as the other, and so may possibly be less efficient as regards reproduction by seed. The chief method of natural spread is by the seeds which, being small and light, are easily carried by wind, &c., and may germinate at considerable distances from the sites of their formation.

The development, below the ground, of corms and cormils leads, under strictly natural conditions, to the consolidation of the area occupied and to some slight degree of local spread. The formation of cormils above ground in the axils of the aerial leaves in *H. miniata* also facilitates the spread of the plant locally. When the aerial parts die down, and subsequently become withered and dry, these cormils are set free and may germinate at some distance from the parent. Thus, even under natural conditions, the Tulips are well equipped to compete successfully with other plants.

Conditions of settlement add to the advantages of the Cape Tulips in this respect. Being usually avoided by grazing stock they may grow unchecked on pasture land where useful species are being eaten out. While the weeds do not grow so well on cultivated land, tillage operations may, by spreading the corms and cormils, increase the areas infested. Some measure of control may be effected by placing badly infested land under crop, but eradication is not effected thereby, and the weed is certain to reappear when such land is restored to pasture.

Other methods whereby the Tulips may be passively spread are the transport of cormils in mud on the feet of animals or on farm implements, the cartage from place to place of earth containing seeds or cormils, the accidental distribution of the latter with seedlings, bulbs, &c., of garden plants, and so on.

Effects on Stock.—The special importance which attaches to the Cape Tulips as weeds of pasture land is due to the known poisonous nature of both species. The poison occurs in all parts of the plants, both in the corms and leaves, and irrespective of whether the latter are fresh or dry. While animals soon become accustomed to the presence of the plants and avoid them, heavy mortalities are by no means infrequent during the winter months, especially when green feed is scarce and where stock have been brought on to Tulip-infested country from districts where the weed does not occur.

The symptoms of Cape Tulip poisoning are partly those of an acute gastro-intestinal irritant, and partly those of a cerebral depressant or narcotic, such as would be caused by the absorption of some active toxic principle. Examples of the first are abdominal pain, diarrhoea, and, if large amounts of green leafy material have been ingested, distention of the stomach with gas, the symptoms increasing in severity and resulting in colic, frequent scouring, great weakness and prostration. The nervous symptoms are indicated by dullness and depression. The precise nature of the toxic substance is not known in the case of *H. collina* or *H. miniata,* but it is probably an alkaloid. Rindl (1924) extracted an alkaloid, which he termed *homeridine,* from *Homeria pallida,* another African species with yellow flowers. According to Rindl, this substance, in large doses, behaves as a cardiac poison, and, in small doses, has an action resembling that of digitalis, without, however, the cumulative effects of the latter substance.

Death may occur rapidly, within 12 hours or less after ingestion of the leaves, or the animals may linger for several days. Where recovery takes place the nervous symptoms do not disappear for some time.

The following, which is quoted by Hutcheon (1900) from the ***Florae Capensis Medicae,*** by Dr. L. Pappe, describes a case of poisoning in human subjects due to ***Homeria collina***:—

> "A Malay woman and three children ate a small basin full of the bulbs of this plant at about 8 p.m. About 1 o'clock in the morning the woman awoke with severe nausea and severe vomiting and found the children similarly affected. She endeavoured to call for assistance but was unable to leave her bed, &c. The two eldest children died, the woman and the youngest child recovered."

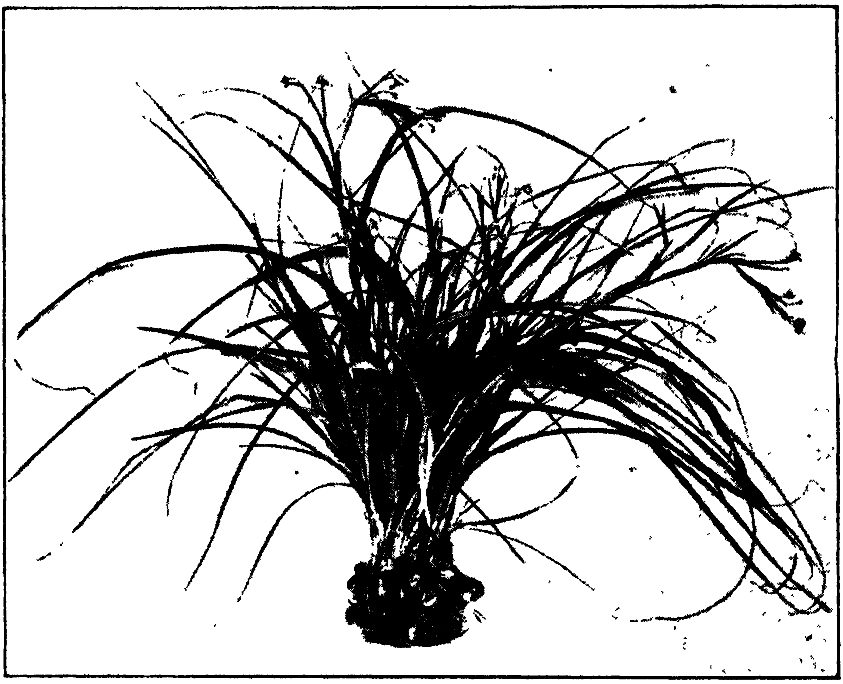

Fig 3 —Two-leaved Tulip. Photograph of a clump of plants, showing the crowded habit, due to cormil formation.

Control and Eradication.— The wide distribution of the Cape Tulips, their habits of growth and multiplication render their State wide control a problem of considerable difficulty. Owing to the relatively small surface presented by the aerial parts, the toughness of the foliage, and the inaccessible position of the corms, these plants tend to be more resistant to chemical sprays than most other weeds. The method of perennation by means of underground corms, and the relative immunity they enjoy from being eaten down by grazing stock during the growing period gives them a marked advantage in competition with other pasture plants. Small patches can be treated by sprays, but high concentrations of weedicide are necessary; another difficulty is that by the time the plants have come into flower and can be clearly recognised a new generation of corms has been formed underground. Unless these are destroyed there will be just as luxuriant a growth of the Tulips the following year. The time of spraying is doubtless important, and one application at least should be made early in the growing season, soon after the plants have appeared above ground. Young foliage is obviously more vulnerable to attack than full-grown leaves, and on land known to be badly infested with Tulips an application of weedicide during the early stages of growth might be productive of more effective results than more liberal treatments, when the plants are more advanced. The old saying—"Out of sight, out of mind"—is nowhere more vividly illustrated than in the case of the bulb-forming perennial weeds which appear above ground during winter and spring, and are lost to sight for the rest of the year. Cape Tulip is a source of trouble every year, and invariably attracts attention, but only when the plants are well advanced and when most of the harm has been done. We are impressed with the importance of finding some method of eradicating this weed when cases of poisoning are brought to our notice and when the plants are visible above ground, but we are apt to turn our attention to other matters when the dry season approaches and the plants disappear from view. But it would be well not to lose sight of the fact that Cape Tulip is due to appear again and will almost certainly cause poisoning of stock during the coming year, and that, where eradication measures are to be undertaken, an early start might make all the difference between success and failure. Spray treatments, in order to be really effective, would probably require to be carried on over a number of years, with several applications during each period of growth.

Where the plants are already in flower, probably the most satisfactory thing to do in the case of small patches is to dig out and burn as many of the plants as possible, taking every precaution against spreading the corms and cormils during the process, and to mark out the patch for treatment with weedicide early in the following season, applying further treatments during that year. In all cases seed production should be prevented whenever possible.

Cultivation is a useful method of reducing the vigour and density of the weed, and on large areas which are badly infested it may be necessary to plough up the land and, after repeated cultivations, to place it under crop. While permanent eradication will not be accomplished by this means, some measure of control will be established. Unfortunately this is not always practicable. In the absence, as yet, of any effective and inexpensive means of eradicating Cape Tulip from large areas of pasture land, efforts should at least be made to prevent it from spreading to new areas by destroying any stray plants which appear, and, as far as possible, to check the growth and seed formation of plants on more densely infested areas.

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CARBONATE OF LIME.

NEGATIVE RESULTS IN WHEAT-GROWING EXPERIMENTS.

[By R. C. Scott, R.D.A., Supervisor of Experimental Work, Department of Agriculture.]

Experiments dealing with the use of carbonate of lime have been conducted at a number of centres and were designed with the object of showing the value of carbonate of lime as a fertiliser for cereal crops.

Lime is an essential plant food, but on the other hand the amount removed by plants is very small, and it is exceptional to find a soil so deficient in this substance as to limit plant growth. At the same time, lime plays an important part in agriculture, because of its influence on the physical properties of the soil. It leads to an improvement in the texture of what would otherwise be sticky heavy clay land. It increases the water-holding capacity and modifies the looseness of sands, whilst it also has influence in neutralising the harmful conditions associated with sour or acid soils.

However, it is not from the point of view of carbonate of lime as an improver of the physical properties of soils that this report has been compiled, but to deal more directly with its value as a plant food for crops seeded on fallow land.

Notwithstanding the fact that no benefits could be anticipated, experiments dealing with this aspect became necessary because of the persistent advocacy of the use of carbonate of lime as a fertiliser by certain interested parties. As a result, a number of farmers have purchased carbonate of lime under a misapprehension as to its manurial value, and it was only by obtaining actual yields from a series of experimental plots scattered throughout the agricultural areas of the State, together with the field demonstrations thus provided, that the true position of this material could be shown.

OUTLINE OF EXPERIMENTS.

Accordingly, arrangements were made with a number of farmers to plant experimental plots under the supervision of officers of the Department of Agriculture. In all, seventeen plots were planned. They extended from Booleroo Centre in the North, throughout the Lower North and Murray Flats to Strathalbyn in the South.

At every centre four plots of wheat were planted on fallow land, each being approximately two acres in area, and receiving the following treatment:—

Plot 1—No manure.
Plot 2—1cwt. of carbonate of lime per acre.
Plot 3—1cwt. 45 grade superphosphate per acre.
Plot 4—1cwt. 45 grade superphosphate together with 1cwt. of carbonate of lime per acre.

In this experiment three comparisons were possible, namely:—

That between the yield from the "no manure" and the 1cwt. of carbonate of lime plots.

That between the yield from the 1cwt. of superphosphate and the 1cwt. of carbonate of lime plots.

That between the yield from the 1cwt. of superphosphate and the 1cwt. of superphosphate plus 1cwt. of carbonate of lime plots.

AGRICULTURE IN THE TEMPERATE AND SUB-TROPICAL CLIMATES OF THE SOUTH.

A Report by the Deputy Director of Agriculture (W. J. Spafford) to His Excellency Sir Winston Dugan, K.C.M.G., C.B., D.S.O., Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia. Mr. Spafford took a brief tour of portions of the principal agricultural countries in the same climatic zones as the settled portions of Australia, in fulfilment of the appointment as Honorary Commissioner, conferred upon him by His Excellency, to inquire into and report upon the Production and Preparation for Marketing of Agricultural Products, including Crops and Livestock in South America, South Africa, and New Zealand.*

(*Continued from page* 801.)

URUGUAY.

The smallest Republic in South America is Uruguay, and the country is of particular interest to others living in the cool parts of the Southern Hemisphere because her existence depends upon agricultural production. Although not so well favoured as some other countries, in so far as soils are concerned, the whole country receives a liberal and well-distributed rainfall, and is not subject to frequent droughts of any severity. Furthermore, Uruguay is very favourably situated for exporting her surplus agricultural products to either Europe or North America.

THE COUNTRY OF URUGUAY.

Located on the eastern side of Argentina, and separated from this country by the Uruguay River, the Republic of Uruguay is a small country almost pear-shaped, with the portion somewhat like the stem end of a pear being at the point where the 30th parallel of south latitude crosses the Uruguay River. The greatest length of the country runs from the north-west corner, in a south-easterly direction to 35° south latitude, a distance of about 370 miles, whilst the greatest width at right angles to the length is more than half-way down the country and extends for about 300 miles. The total area is 72,153 square miles.

The great bulk of the country is steeply undulating to hilly, the hills rising abruptly from valleys, and being more or less table-topped. The hills occupy a much greater area than do the valleys and lower plains, and in most cases are very stony, and rather similar in appearance to the stony hills so typical of South Africa. Although a hilly country, few, if any, of the hills reach a height of 2,000 feet, so that Uruguay cannot be described as a high country.

It is generally understood that most of the Republic is suitable for agriculture, and this is to be expected, because there is very little land too high for farming purposes. Most of the waste land is stony, or the actual area occupied by lakes and streams. On the hills the soils are mostly very shallow and only fairly fertile, but in the valleys, good, rich chocolate soils capable of growing crops and luxuriant pastures are usually to be found. In the fairly extensive strip of arable land along the southern end of the Republic, and extending up the Uruguay River to Salto, deep, chocolate-coloured clayey soils, resting on impervious clays, are generally present, and these being obviously fertile soils should produce very heavy crops indeed, when properly treated.

Rivers and creeks form a network all over the country, and besides this source of water, the underground supplies are really plentiful, even at shallow depths, and in many places sub-artesian water is to be got at depth. The big Uruguay River, which is some 940 miles in length, is navigable up to the rapids at Salto, which is somewhere about 200 miles above the mouth, and over 300 miles above Montevideo, the capital of the country, which is located on the River Plate.

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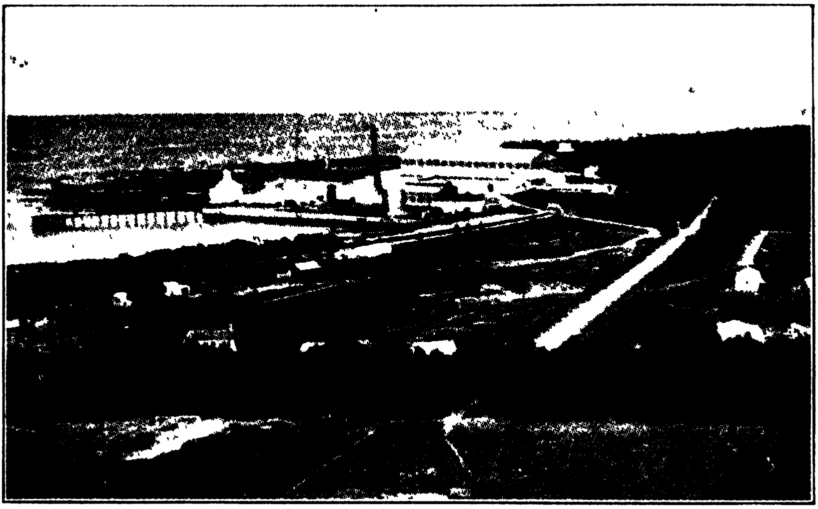
*Tour made in the company of Col. C. P. Butler ("Yattalunga," of the *Advertiser* and the *Chronicle.*)

Few forests of any kind exist in Uruguay, and, as a matter of fact, other than those planted for shade and breakwinds, trees are rare, except along rivers and creeks.

The climate is very healthful for people and domesticated animals, and really favourable for most crops, the summer being sunny and fairly warm in the daytime, but relatively cool at night, and the winters prove, practically always, to be fairly mild.

RAINFALL OF URUGUAY.

The average annual rainfall does not vary a great deal over most parts of Uruguay, for although in one locality it approaches 50 inches, the great bulk of the country gets about 35 inches. The following table shows the average annual rainfall for the two years 1933 and 1934, for the nineteen political departments into which the country is divided:-



[From *La Industria de las Carnes en el Uruguay.*

A Fairly Extensive Saladero, or Salting-down Works, in Uruguay.

Throughout Uruguay and Southern Brazil enormous quantities of beef are salted and sun dried, and when preserved in this way is known as Xarque (Sharkey). Most of the Xarque made in South America is used in Brazil.

Average Annual Rainfall of Uruguay, 1933 *and* 1934.

	Inches.
Artigas	41.3
Salto	34.8
Rivera	47.2
Paysandú	34.2
Tacuarembó	39.0
Cerro Largo	41.4
Rio Negro	34.7
Durazno	39.3
Trienta y Tres	42.0
Soriano	39.9
Flores	38.9
Florida	36.1
Lavalleja	34.6
Rocha	35.5
Colonia	38.6
San José	34.3
Canelones	34.5
Maldonado	34.8
Montevideo	32.9

Not only is the country well served with a liberal rainfall, but it is very evenly distributed throughout the year. There is an appreciable variation from month to month in the quantity of rain recorded, but no month is a dry month, and of the four seasons of the year, autumn (March to May) receives about 30 per cent. of the total, winter (June to August) about 20 per cent., and spring (September to November), and summer (December to February) about 25 per cent. each.

THE AGRICULTURE OF URUGUAY.

The importance of agriculture, and particularly livestock farming, to Uruguay, is readily seen by a look at the export figures of the country, and the next table presents the percentage value of all the principal exports in the year 1932:—

Value of Exports from Uruguay in 1932.*

	Percentage of Total Value of Exports.
Livestock and Their Products—	
Live animals	1.00
Meat and meat extracts	32.15
Wool	32.04
Hides and skins	12.92
Fats	1.91
Hair	0.39
Bones and bone ash	0.30
Manures	0.27
Horns	0.10
Other products	1.27
	82.35
Crops and Their Products—	
Grains, flours, and pastes	6.84
Fruits and vegetables	0.09
Fodders and oil cakes	0.38
	7.31
Minerals and metals	4.88
Game and fish	1.31
Various articles	4.15
	100.00

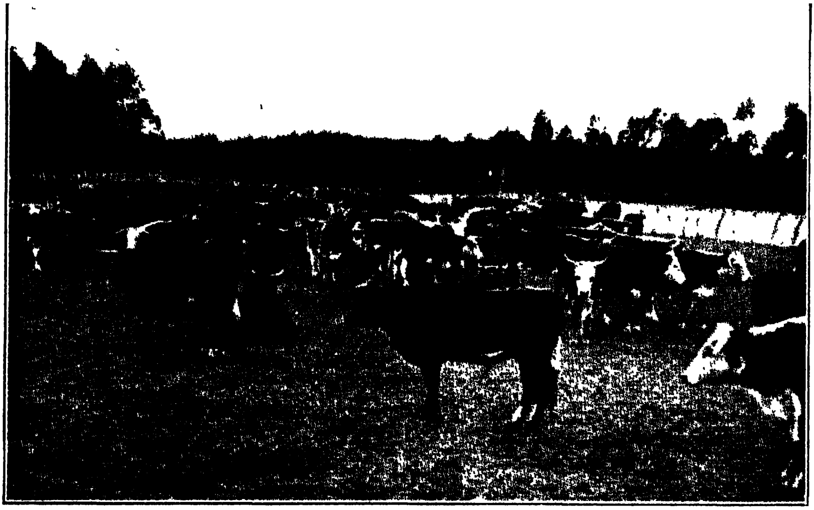
*Síntesis Estadístico de la República Oriental del Uruguay.

These figures show very clearly why Uruguay is generally described as a grazing country, because over 82 per cent. of the value of her exports consists of livestock products, nearly every bit of which is derived from pastures. Very little pig products are exported, and practically no hand-feeding of meat-producing animals with concentrates, is practised anywhere in the country.

It appears that not much attempt is made to improve the natural pastures of Uruguay, either by establishing useful pasture plants or by fertilising existing pastures, and as a consequence, although the pastures are evergreen in most parts of the country, there is a period in every year when the grazing animals lose their condition. It is usually stated that Lucerne will not grow well in the country, but although not making equal growth with that of Argentina, patches of the crop seen here and there throughout the Republic were quite fair, and make it appear that the crop can be successfully grown in most places where the land is arable. Even cereals are not grown for grazing by fattening livestock, nor have there been many attempts to establish pasture plants proved to be suitable in similar climatic conditions. The shallow soils, resting on stones, so usual on many tablelands, grow rather stunted pastures which appear to be of fair quality, the grasses consisting largely of Couch or Bermuda grass (*Cynodon dactylon*), *Paspalum dilatatum*, Water Couch grass (*Paspalum notatum*), and another rather short fine-stemmed grass, whilst leguminous plants are of rare occurrence. In the valleys, most of which have rich, chocolate-coloured soils, the pasture growth is luxuriant. The shortage of legumes amongst the pasture plants is noticed by landholders, and it appears to be generally recognised that the best fattening pastures are those containing a fair proportion of leguminous plants, the principal ones which have become established in places are Toothed Medic (*Medicago denticulata*), and Spotted Medic (*Medicago arabica*).

THE FARM LIVESTOCK OF URUGUAY.

In the year 1860, Uruguay was maintaining about three and a half millions of cattle, about two millions of sheep, and about a half million of horses, and just a few thousands of other kinds of stock, but within 50 years cattle had increased to over 8,000,000 head, sheep to nearly 26,300,000, horses remained at about the half million, pigs had multiplied to 180,000, and the less important farm livestock, such as goats to about 20,000, and asses and mules (together) to about 22,000 head.



[From *La Industria de las Carnes en el Uruguay*.

Cattle Awaiting Slaughter in Uruguay.

Hereford is the predominant breed of cattle in Uruguay, about 63 per cent. of the cattle of the country being of the Hereford breed. Cattle Tick, deficient pastures, and lack of care in breeding tend to keep down the quality of the cattle

Between the census periods of 1908 and 1930 there has been a general decline of all kinds of farm livestock except pigs and poultry, and it is generally recognised that the cause of the decline is the great increase in crop growing that has been brought about during the same period. The decrease in cattle numbers, which amounts to about 1,000,000 head, is alleged to be caused by the increase in the number of sheep being maintained, but however true this may be in recent years, it can hardly be the principal reason for the reduction, because there are over 6,000,000 sheep fewer now than there were in 1908. Sheep declined rapidly from 26,286,296 head in 1908 to 11,472,852 head in 1916, but recovered to over 20,000,000 head by 1930. The pig population has changed from about 180,000 in 1908 to about 308,000, and poultry numbers have been increased during the same time from 3,143,526 to 4,927,196.

Details of the changes in numbers since the census of 1860 are shown in the table following:—

Number of Livestock in Uruguay Since 1860.

Animals.	Census Year.					
	1860.	1900.	1908.	1916.	1924.	1930.
Cattle	3,632,203	6,827,428	8,192,602	7,802,442	8,431,613	7,127,912
Sheep	1,989,929	18,608,717	26,286,296	11,472,852	14,443,341	20,558,124
Horses	518,208	561,408	556,307	554,871	521,820	—
Mules and Asses	8,301	22,992	22,099	17,537	18,576	14,998
Pigs	5,851	23,923	180,099	303,958	251,253	307,924
Goats	5,437	20,428	19,951	12,218	18,888	—
Fowls	—	—	3,143,526	4,134,498	4.097,468	4,393,648
Turkeys	—	—				316,956
Ducks	—	—				140,947
Geese	—	—				75,645

CATTLE IN URUGUAY.

There is no comparison between the cattle produced in the adjoining countries of Argentina and Uruguay, those of the former being noted for their high quality, whilst the cattle of Uruguay are rather poor. Of animals of which the breeding is known Herefords predominate, and of the 7,128,000 present in 1930, about 4,500,000 were of the Hereford breed, and about 2,000,000 of the Shorthorn breed. This state of affairs appears to be due to the fact that the Cattle Tick is present throughout Uruguay, and the pastures on much of the country are rather too scanty for the rapid-maturing Shorthorns. The absence of a high proportion of leguminous plants in the pastures, the neglect of frequent importations of well-bred, high class bulls from Great Britain, and the failure to grow fodder crops or to supply concentrates to the growing beasts, preclude all chances of the cattle reaching the high standard attained by Argentina.

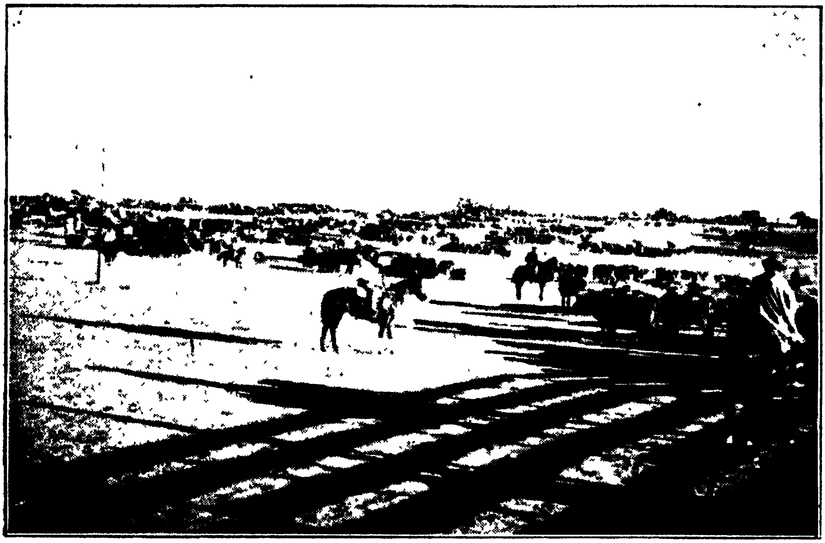
Cattle Slaughtered and Beef Exported, Uruguay. *

Year.	Animals Slaughtered. †	Beef and Veal Produced.	Beef Exported.	
			Chilled and Frozen.	Canned. ‡
	No.	Tons.	Tons.	Tons.
1928	1,272,000	243,000	72,800	26,100
1929	1,375,000	255,000	75,500	32,100
1930	1,285,000	247,000	110,000	33,900
1931	1,102,000	212,000	80,500	28,450
1932	916,000	176,000	64,500	19,850
1933	1,006,000	193,000	57,750	26,800
1934	—	—	50,800	—

†Not including farm slaughterings.
‡Mainly beef.
*"Meat" of Imperial Economic Committee, May, 1935.

SALE OF CATTLE IN MONTEVIDEO.

Montevideo, the capital city of Uruguay, has a population of about 700,000 people, and has three large frigorificos exporting beef to overseas ports, and so the cattle requirements for local consumption and export are fairly considerable. To meet the demand a cattle sale is held five times a week, from 8 a.m. to 11 a.m., and is conducted in a unique manner, for the various mobs assemble in an open space without yards of any kind, and are kept in positions from 6 to 10 yards apart, by horsemen. Calves, up to almost 12 months of age, are placed in yards on the outskirts of the principal sale area, but all older animals are kept in the open throughout the progress of the sale. The herds are comprised of from 3 to 70 or so head of cattle, and the ingenuity of the horsemen in keeping the



Cattle Sale in Progress in Montevideo, Uruguay.

Mobs of cattle, of from 3 to 70, are kept apart by horsemen throughout the period of the sale, despite the fact that the buyers and their clerks, mounted on horses, ride through the groups when negotiating a purchase.

[From *La Industria de las Carnes en el Uruguay.*

Driving Cattle on to a Weighbridge after being Sold in the Montevideo Sale-yard.

As is usual throughout South America, all animals for slaughter are sold by liveweight, and so large weighbridges are necessary at all important sale-yards. On the town side of the sale-yard at Montevideo two large weighbridges, each capable of taking fairly big mobs of cattle at a time are provided, and so little delay occurs in getting the cattle on the road towards the frigorificos after being purchased.

herds separated, one from the other, is remarkable. Buyers and their clerks, all on horseback, ride into the herds to get a proper look at them, and then haggle over the price with the seller. Now and again a beast breaks away, but several horsemen give chase, and the animal is brought back to its herd and soon settles down. Several hundreds of horsemen are necessary in such a market, as everything is done from horseback. Saddled horses can be hired at the site for the use of anyone interested in any phase of the sale. It has become customary for different types of cattle to be held in particular portions of the area, but this is not obligatory. All sales are made subject to delivery at the frigorifico for which the cattle were purchased, and immediately a sale is made the herd is weighed, and then driven to the frigorifico. As all mobs leave by the same road, several lots are travelling along at the one time, separated one from the other by 2 or 3 horsemen, and although only a few yards apart rarely get mixed together. Cattle unsold by 11 a.m. are removed from the area and may be offered for sale on next sale day. Such a sale is only possible with the quietest of cattle.

SHEEP IN URUGUAY.

Sheep products constitute the most important line of production of Uruguay, and from an export point of view are of greater value than any other particular group of articles, including cattle and their derivatives.

[From *Bulletin of the Pan American Union.*

Sheep in the Yards of a Frigorifico at Montevideo, Uruguay.

All animals visible in the illustration are of the long-woolled type of British sheep, to which class most of the sheep of the country belong, although at one time Merinos were popular

In numbers, sheep reached their peak in 1908, when 26,286,296 head were maintained, but shortly after this time the flocks receded to less than half, but have again increased to somewhere about 20,000,000 animals.

Some years ago Merino sheep were quite prominent in Uruguay, and were then encouraged because of the fine type of wool being produced, but even before the war they were losing their popularity. As recently as 1924, about one-third of the wool of the country was of the Merino type, but ever since that time the proportion of this kind of wool has become less and less, being replaced by the coarse crossbred type of wool. Even though the finer types of wool are not produced in very great quantities, wool is the most important for export purposes, of all the products of the country, and in value is worth over 32 per cent. of all exports. As considerable quantities of mutton and lamb are also exported, sheep are of the utmost consequence to Uruguay in her present stage of development.

Wool and Mutton Produced and Exported—Uruguay.

Year.	Wool.		Mutton and Lamb.	
	Produced.	Exported.	Animals Slaughtered. *	Exported.
	Tons.	Tons.	No.	Tons.
	62,544†	52,614‡		
1928.............	—	—	1,153,266	13,950
1929.............	67,455	50,171	2,291,815	21,950
1930.............	68,125	76,918	2,725,089	27,800
1931.............	47,321	64,406	1,955,454	18,100
1932.............	49,196	42,376	837,629	6,100
1933.............	46,741	-	1,270,000	9,500
1934.............	51.339	—	—	7,750

*Not including farm slaughterings.
†Average, 1926 to 1930.
‡Average, 1925 to 1929.

Most of the sheep seen in the market and on farms belonged to one or other of the long-woolled breeds, or were crossbreds containing a lot of long-woolled blood. Of pure-bred sheep, Merino, Lincoln, and Romney Marsh are the most popular, and although Uruguay has a fair reputation for sheep, all of the animals seen, with the exception of a few Romney Marsh, which were of fair quality, were poor in type, and at the same time not carrying much condition. Some good Romney Marsh and fair Merinos were heard of, but none that could be classed as such were encountered. In the sheep market where animals for slaughter are sold, as to be expected most of the mature sheep were of a long-woolled type, but the great majority of the lambs were also of this type, although a fair sprinkling of lambs by Shropshire sires were in evidence, and were of good mutton type, but a bit poor in condition.

PIGS IN URUGUAY.

Pigs are not yet very prominent in Uruguay from an export point of view, but they have made a rapid and regular increase in numbers ever since the census of 1860, and appear as though they will become of great importance to the country in the future. The animals seen were mainly of the Duroc Jersey or Poland China breeds, or crossbreds containing one or both breeds in their make-up, but although in good order were much too fat, and showed no indication of an effort having been made to modernise the type.

POULTRY IN URUGUAY.

Poultry keeping is popular in Uruguay and the number of birds being maintained is increasing with time. Poultry for table purposes take prominent place amongst the foodstuffs of the people, and markets are generally well stocked with birds for killing. All sorts of mixtures of breeds appear to be in the breeding of most of the fowls seen, and the only two pure breeds at all plentiful are Plymouth Rocks and Rhode Island Reds. Of turkeys, which kind of poultry is to be seen in most parts of the country, Blacks appear to be very prevalent. Muscovy ducks are presented for sale in large numbers in the markets, and also another breed very similar in type, but having white body, grey wings, and a much cleaner head than the Muscovy.

CROPS IN URUGUAY.

From an agricultural point of view, Uruguay is an important livestock country, but crops do not occupy such a prominent position, particularly as far as exports are concerned Nevertheless, the country produces sufficient for her own requirements, of almost everything, and exports a little of several of the different kinds of crops.

Wheat is easily the most important of the crops commonly grown, the area seeded each year exceeding 1,000,000 acres. Next to wheat comes maize, with a little over half a million acres a year, and then linseed which is grown on about 400,000 acres a year. Other than these crops, none occupies an extensive area, although in almost all instances sufficient is produced for local consumption requirements.

The progress of the principal crops of the country, except citrus fruits and vines, is shown in the following table:—

Progress of Principal Crops in Uruguay.

Crop.		1901. †	1911. †	1921. †	1931. ‡
Wheat—Area	(acres)	722,762	798,413	811,766	1,079,005
Yield	(tons)	203,241	234,067	265,795	300,959
Oats—Area	(acres)	269	50,416	106,852	147,701
Yield	(tons)	113	26,020	29,502	44,353
Barley—Area	(acres)	3,283	6,232	2,717	9,769
Yield	(tons)	998	1,796	899	3,171
Canary Seed—Area	(acres)	4,283	469	820	12,454
Yield	(tons)	1,084	145	129	2,749
Linseed—Area	(acres)	27,642	142,514	60,910	442,686
Yield	(tons)	8,404	21,918	12,938	120,771
Maize—Area	(acres)	448,448	498,211	571,311	518,732*
Yield	(tons)	139,118	90,794	196,846	158,181
Peanuts—Area	(acres)	—	—	3,496	2,062*
Yield	(tons)		—	839	462
Potatoes—Area	(acres)	-		9,213	16,235*
Yield	(tons)	-	—	8,049	29,546
Sweet Potatoes—Area	(acres)	—	—	23,556	18,947*
Yield	(tons)	-	-	43,404	33,873

*1932.
†Anuario Estadístico de la República Oriental del Uruguay.
‡Síntesis Estadístico de la República Oriental del Uruguay.
NOTE.—In translation hectarea taken as 2.47 acres, and quintal as 220lbs.

Of important crops not shown in the above table, citrus fruits are becoming prominent, slowly but surely. It is generally recognised that really good quality citrus fruits can be grown with certainty in almost all parts of the Republic. The climate is ideal for these fruits, water is plentiful, and there are considerable areas of sufficiently fertile soils in many parts of the country to make a flourishing industry of citrus-fruit production. The natural conditions are favourable, and the relatively close proximity of the shipping port of Montevideo to the important European markets, makes it appear inevitable that Uruguay comes into the citrus-fruit trade with some force in the future.

WINE-MAKING IN URUGUAY.

Vine-growing for the production of wine has been an important agricultural activity in Uruguay for a long while, and the progress made in the past 50 years or so has been really considerable. The area planted with vines for wine making is about 30,000 acres and the production of wine is about the 12,000,000 gallon mark.

Progress of Wine-Making in Uruguay.

Year.	Vineyards.	Area of Vineyards.	Wine Made.
	No.	Acres.	Gallons.
1898	824	8,919	737,285
1908	1,330	12,580	4,083,969
1918	2,143	16,974	5,628,927
1928	3,474	26,923	7,893,009
1932	—	—	11,736,877†

*Anuario Estadístico de la República Oriental del Uruguay.

†Síntesis Estadístico de la República Oriental del Uruguay.

NOTE.—In translation hectarea taken as 2.47 acres, and litro as 0.22galls.

GENERAL.

Uruguay appears to have great possibilities, relative to her size, as an agricultural country, but before this can be brought about very considerable improvements must be made in her practices, many of which are rather old-fashioned. Soil-cultivating teams consist largely of yokes of oxen, varying between 2 and 8 animals, depending upon the job being done, and one plough team seen had 2 oxen on a pole, and a horse as a leader, with a boy riding on the leader to guide the team. Some of the market gardens, orchards and vineyards are really well cared for, but others were rather neglected, and the annual growth of most vines and fruit trees was far from luxuriant. The maize crops were in all stages between young growth about a foot in height and ripe crops, but all were poor compared to those seen in the adjoining country of Argentina. With the exception of pigs, most of the animals for slaughter—cattle and sheep—as seen on farms and in sale yards, were of deteriorated type, or low in condition. This state of affairs cannot last for long, because the people are being educated, and so efficient is the system that there are less illiterate in Uruguay than in most South American countries. The compactness of the country, the regularity of soil and climate, the favourable climate for agricultural purposes, the prevalence of easily obtained water supplies, the efforts being made to educate the people, and the proximity to the European markets make it appear that this small Republic of Uruguay will be heard of in the future as an agricultural country of some note.

SUMMARY OF IMPRESSIONS GAINED IN URUGUAY.

1. The small Republic of Uruguay is almost pear-shaped, and is about 370 miles long by 300 miles in width.

2. The great bulk of the country is steeply undulating, the hills, which occupy a greater area than the valleys, being stony. Few, if any, of the hills reach a height of 2,000 feet.

3. Most of Uruguay is suitable for agriculture, but the high tablelands are stony, whereas the valleys are very fertile.

4. Water is plentiful in Uruguay.

5. The climate of the Republic is very favourable for livestock and crops, and the rainfall is plentiful and well distributed.

6. Uruguay is essentially an agricultural country, and is particularly important as a producer of livestock, nearly all of her returns for exports being obtained from this source.

7. At present, practically all livestock are carried on natural pastures, very little having been done to improve the pastures, and few attempts made to practise hand-feeding.

8. A great increase in the numbers of all farm livestock was brought about up to the 1908 Census, but since that time, all kinds have declined, except pigs and poultry.

9. Cattle are maintained in great numbers in Uruguay, and the Hereford breed predominates, the pastures being a bit too scanty for fast-growing Shorthorns. Large numbers of high-class cattle are not to be seen in Uruguay, although climatic conditions are similar to those of the neighbouring country of Argentina, where cattle are so good.

10. The cattle sale held five times a week in Montevideo is unique, in that all mobs being offered for sale are held as separate groups by horsemen, in the open without yards.

11. Sheep husbandry is the most important activity of the country, and from an export point of view, sheep products are of greater value than any other particular group of articles.

12. At one time it appeared that Merino sheep were likely to become really prominent in Uruguay, but of recent years the popularity of the breed has declined in favour of long-wools and crossbreds.

13. Most of the sheep seen were only fair in type, and rather low in condition.

14. Although pigs are steadily and regularly becoming popular, little effort appears to have been made to modernise the type.

15. Poultry keeping is an important agricultural activity in Uruguay.

16. Crops are not very important in Uruguay, from an export point of view, but sufficient of most kinds is grown to satisfy local requirements.

17. Wheat, maize, and linseed are easily the most important crops of the country.

18. Citrus fruits develop well in Uruguay, and, as so much of the country is suited to the production of these fruits, it appears as though they will become a very important agricultural production in the near future.

19. The growing of grapes for wine-making is already an important agricultural activity, and, in all probability, will be increased to a considerable extent in the future.

20. Uruguay has possibiities of becoming an important agricultural country, relative to her size, but before this is possible, modernisation of practices is necessary.

SOUTHERN BRAZIL.

Located at about the Tropic of Capricorn and south of this line, and having a high proportion of Germans and Italians, and their descendants, amongst the population, it is reasonable to expect that it would be in Southern Brazil that the great bulk of the temperate-climate crops, and European livestock raised in Brazil would be produced. This proves to be so, and most of the meat, wool, cereals, beans, grapes and temperate-climate fruits are obtained in this zone.

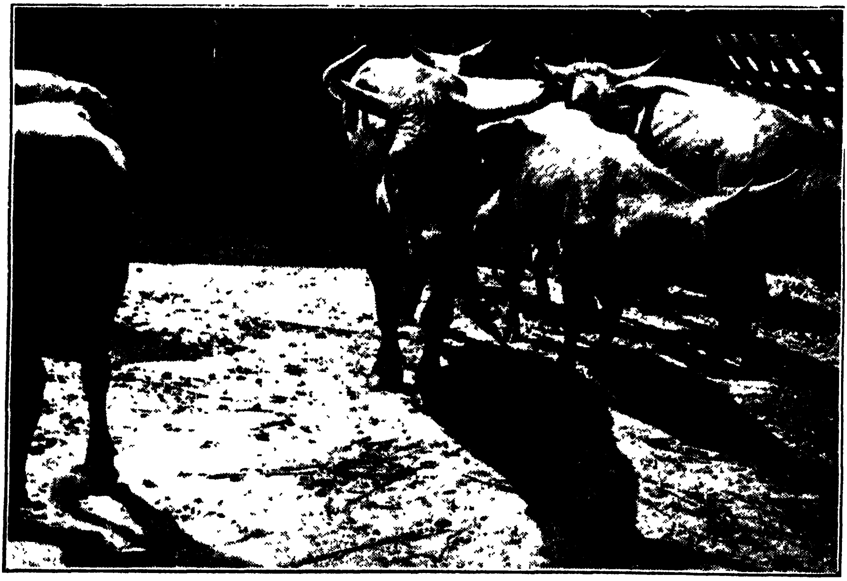
THE STATES FORMING SOUTHERN BRAZIL.

The principal part of Southern Brazil consists of the four States of Rio Grande do Sul, Santa Catharina, Paraná, and Sao Paulo, of which Rio Grande do Sul is the most southerly, and so the most temperate, in so far as climate is concerned.

The State of Rio Grande do Sul contains something over 90,000 square miles of country and, as such, is larger than the adjoining Republic of Uruguay. The average annual rainfall for the State during the 22-year period, 1910 to 1931, was 50.4in., but the variation from year to year is great, for, in 1914, the rainfall was 70.1in., whereas in 1917 it was only 26.0in. Nearly half the cattle of Brazil are maintained in Rio Grande do Sul, most of the sheep of the country are in this State, and a lot of the pigs also; and because of the rich arable soils, which exist as well as the good pastures, the production from crops such as cereals, beans, grapes (for wine and table use), and oranges is fairly high.

Fat, Hairless Pigs, Common in Southern Brazil.

Brazil maintains about 22,000,000 pigs, most of which are located in the Southern Provinces Pig fat is so important to the populace for cooking purposes that every effort is made to get the animals to put on as much fat as possible before sending them to be slaughtered. Carcasses are to be seen with 6 inches of back fat, and the pigs would be more valuable still if more fat could be developed.



Criolla, or Native Cattle of the Tropics of South America.

The direct descendants of the original cattle brought into the country by the Portuguese and Spaniards in the early days of settlement, the Criolla cattle are resistant to cattle tick and tropical diseases. These animals are used largely for Xarque and canning, and having extra thick hides are particuarly valuable for this reason.

The State of Santa Catharina, adjoining the northern boundary of Rio Grande do Sul, only contains about 16,800 square miles of territory, and because of its location is rather warmer, and although producing some of the same agricultural products, cattle comprise the principal form of livestock, and of crops coffee is of some importance.

The State of Paraná, containing about 97,500 square miles, is largely mountainous, but the other portions, which have favourable climate for crop growing, are being brought under cultivation, and the important crops are coffee, cereals, and beans.

The State of Sao Paulo is of considerable dimensions, and embraces about 112,570 square miles, and although some of the country is inside the Tropic of Capricorn, much of the State has a more or less temperate climate, and so large numbers of cattle are maintained, and a fair amount of the cereals is grown. Coffee, cotton, and sub-tropical fruits are produced in great quantities in the State of Sao Paulo, and considerable extensions have been made, and great interest is being shown, in the growing and packing for export, of citrus fruit.

LIVESTOCK IN SOUTHERN BRAZIL.

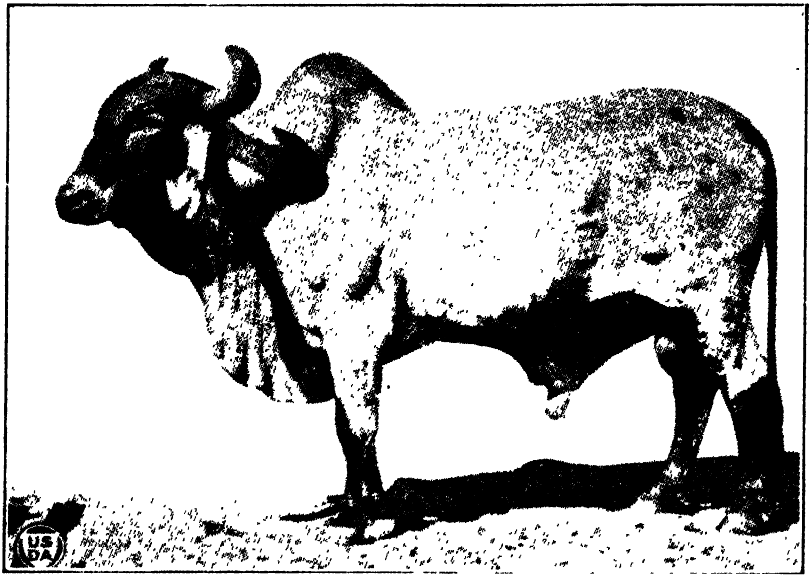
Brazil maintains about 43,000,000 head of cattle, about 11,000,000 sheep, and about 22,000,000 pigs, and most of these are to be found in Southern Brazil, the numbers of all kinds becoming greater and greater as the extreme south of the country is reached. Nearly all of the sheep and about half of the cattle are located in Rio Grande do Sul, whilst about three-quarters of the pigs are between the northern boundary of Sao Paulo and the southern boundary of Rio Grande do Sul.

A Mob of Grade Zebu Cattle at a Frigorifico in Sao Paulo.

Although of peculiar appearance to anyone accustomed to European types of cattle, grade Zebus are useful beef beasts, and produce hindquarters good enough to ship to Europe.

The cattle being handled by the frigorificos and other killing works in the south, are almost wholly of British breeds, with just a light sprinkling of crossbreds containing a little Zebu blood, but at the frigorificos located in the towns of Sao Paulo and Santos, as well as in the numerous slaughtering establishments scattered about the country in the State of Sao Paulo, Zebu blood predominates, and the only other animals of other breeds seen in any numbers are Criolla and Caracú.

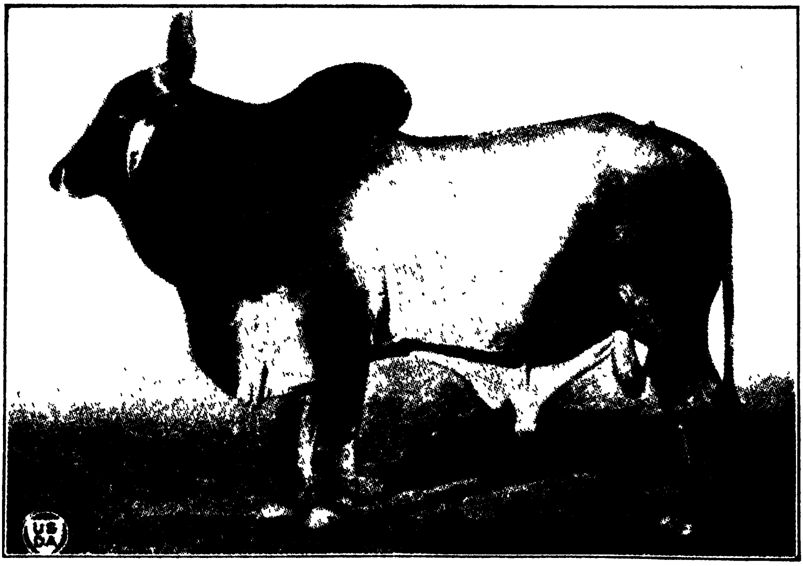
In those districts where the better breeds of cattle can be maintained, even if much attention must be bestowed upon them, it is generally recognised that the



[*From* "*Brahman* (*Zebu*) *Cattle*" (U.S. Dept. of Agric.).

Pure-bred Gir Bull.

The Gir Strain of Zebu cattle is very prominent in Southern Brazil, and although it has a marked effect in grading up native cattle, bulls resulting from mating this strain with Guzerat are of greater value for this purpose. The animals of the Gir strain are usually brindled or dull-brownish colour, and when used for grading up other breeds brindled offspring often appear.



[*From* "*Brahman* (*Zebu*) *Cattle.*" (U.S. Dept. of Agric.).

Pure-bred Guzerat Bull.

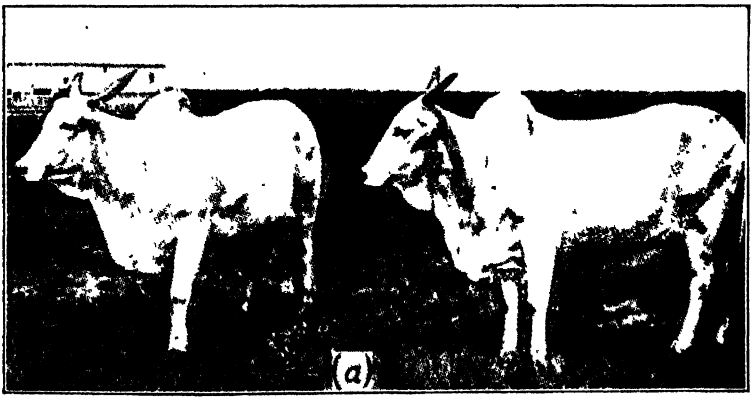
The Guzerat strain of Zebu prove adaptable to South American conditions, but are not so useful in grading up native cattle as are bulls produced when Guzerats are mated to other strains of Zebu.

Zebu can be replaced with advantage. Cattle men in the extreme south of Brazil consider that crossbred Zebu cattle are useful for rough country, and particularly if it is badly tick-infested, but should be eliminated as soon as the country is cleaned up, and then Herefords should be used, even though it is necessary to dip them every 18 days in the bad season, and less frequently at other times.

[*From "Brahman (Zebu) Cattle."* (U.S. Dept. of Agric.).

A Zebu Bull, the Progeny of the Mating of Gir and Guzerat Strains.

This kind of Zebu bull grades up the native cattle of Southern Brazil much better than do the bulls of either of the strains from which it is derived. The mixing of the strains gives greater development to the individuals produced, and also appears to increase their vigour and prepotency.



[From *Kelley's "Zebu Cross Cattle."*

Pure-bred Nellore Cows.

Animals of the Nellore strain of Zebu cattle are also used in Southern Brazil, but not to the same extent as Gir and Guzerat strains.

Although Zebu cattle are not held in great favour where the climate is sufficiently temperate in character to admit of the production of better-class cattle, they are very popular indeed in the warmer districts of Southern Brazil, and many cattle men foresee the day when other breeds will be replaced entirely by Zebus or Zebu crossbreds. Even though very little care has been shown in the selection of the breeding animals, they are gaining in popularity day by day, and an important trade in the exportation of hindquarters of Zebu cattle has already been developed. The meat of Zebu cattle is of a lighter colour than that of the British breeds, and as such is much more attractive when chilled, but, on the other hand, because of this light colour, canners prefer the darker-coloured meat of the British breeds.

A strong effort is being made by the meat exporters of the State of Sao Paulo to improve the Zebu cattle of the country, and good-quality bulls are being imported for the purpose, and stud herds have been established. It is being found in these cattle-improving tests that bulls of the various strains of Zebu brought direct from India do not lead to a very marked improvement of the local animals, but that animals bred in Brazil are very much better in this regard, and particularly is this so if the bulls bred in the country are the result of crossing two strains of Zebu together. The most of the importations are of the Gir and Guzerat strains of Zebu, and when animals of these two strains are mated together they produce specially good bulls for grading up the native cattle. The other important strain being used is the Nellore, but less is heard of this strain than of the other two.

Zebu cattle are very quiet indeed when carefully handled, but are inclined to take fright easily, and then are difficult to manage. When disturbed they have the reputation of being faster than horses, and are able to leap all ordinary fences with the greatest of ease, and bulls and steers are said to charge almost anything on sight.

There is a Herd Book kept in the city of Sao Paulo for Caracú cattle, and large numbers of animals of this breed are produced in the State, and pure-bred bulls are in fair demand at remunerative prices. The Caracú breed is derived from the early importations of Portuguese cattle, but beef exporters claim that besides not being as hardy as the Zebu, they do not kill out so well, and as a consequence these men are encouraging cattle breeders to increase the numbers of Zebu at the expense of the Caracú.

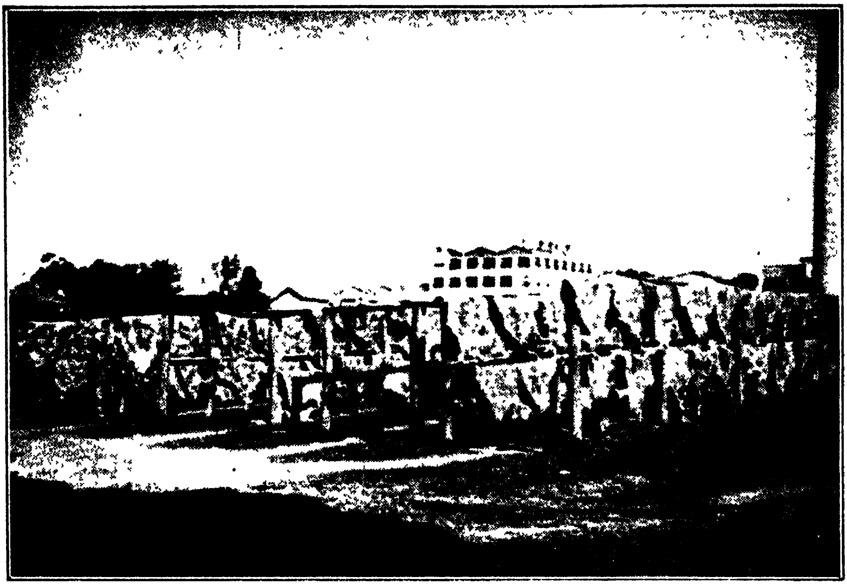
THE PRESERVATION OF BEEF AS XARQUE.

Before the advent of freezing for the preservation of meat, or the sealing of meat in cans or other containers, enormous quantities of beef were preserved in South America with the aid of salt and sundrying. This material, known as Xarque, is still of such importance that the meat from over 1,000,000 head of cattle is preserved in this manner each year in Southern Brazil. As a rule, rough cattle are used for Xarque, but for this method of preservation the meat from such animals is quite as good as from the best of cattle. The flesh of the carcasses, including the fat, is removed in slabs about 5ft. in length by 2ft. 6in. in width, and has the animal heat removed by being subjected to a strong blast of cooled air from powerful fans. With sharp knives, the meat is slashed in long lines a few inches apart, the cuts being nearly deep enough to go right through the slabs of meat. The slabs are thrown into a tank of strong brine, and kept there for 45 minutes, being agitated with plungers worked by hand for the whole time. On removal from the tank the slabs are stacked to a height of about 5 feet, a full covering of coarse-salt being given to each layer of meat. The meat is restacked after 24 hours in the first stack, this time without a further addition of salt, and is kept in the stack for another 24 hours, when the surplus salt is removed from the meat. Depending upon the weather at the time, the meat is carted out for sun-drying, or is again re-stacked, where it can remain with perfect safety for 4 months or so. When sun-drying starts, the slabs are put out on trellis-like fences every morning, and brought into stacks every evening, and covered with tarpaulins for the nights. On the completion of drying the slabs are packed in bales, putting 500lbs. per bale. This unattractive dried meat is sold in Brazil, and is used in soups, and as flavouring for the staple foodstuff of so many people, viz., beans.

[From *La Industria de las Carnes en el Uruguay.*

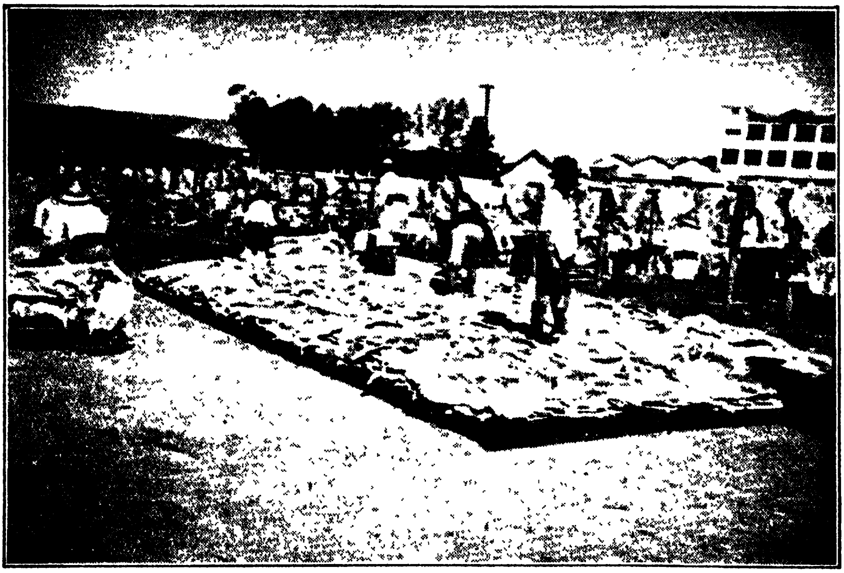
A Slab of Xarque, as made in South America.

For preservation as Xarque the whole side of the carcass of beef, except the hindquarters, but including all the fat as well as the lean, is kept intact, and after salting and sundrying has the unattractive appearance as here shown.



Sundrying the Beef in the Preparation of Xarque.

After being immersed in brine for a short time, and then drained and stacked with a liberal allowance of coarse salt, the slabs of meat are hung on fences to dry in the sun.



Stacking the Slabs of Beef which are being Converted into Xarque.

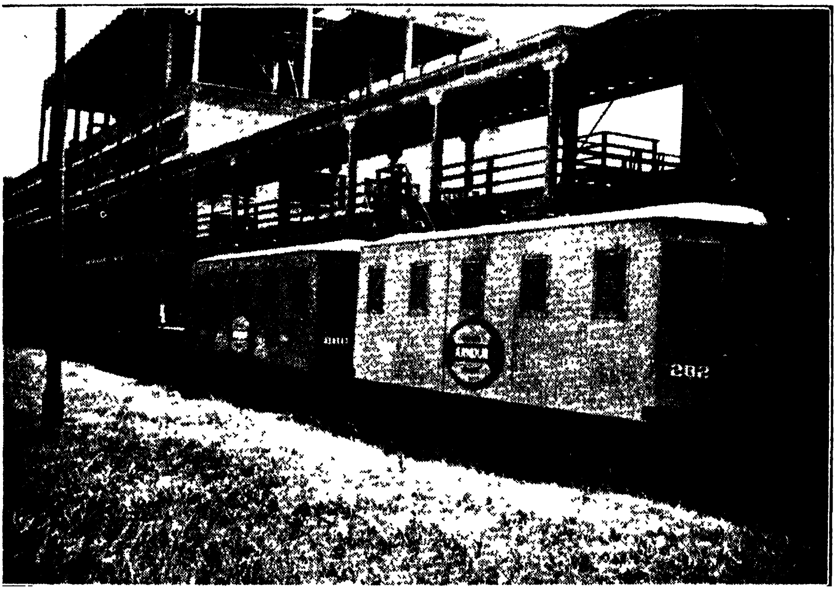
In the manufacture of Xarque the partly dried meat is brought on to wooden platforms every evening, carefully stacked, and covered with tarpaulins to protect it from rain and dew.

DISTRIBUTION OF MEAT IN SAO PAULO.

The large city of Sao Paulo, with a population of over 1,000,000 souls, has simplified the distribution of the meat to the people by utilising the electric tram system of the city. Armour's Frigorifico, of Sao Paulo, does much of the slaughtering for the city, and cool vans, run by the Electric Tram Company on the tram lines, pull right alongside the killing works, load up with carcasses, and deliver them to depots in various parts of the city, from where the retailers pick up their supplies.

ORANGES IN SOUTHERN BRAZIL.

Of considerable interest to Australia is the fact that the number of oranges being exported from Brazil is on the increase. In the past great quantities of oranges have been handled more like potatoes than as valuable fruits, and loose heaps were to be seen on barges on the rivers, and on railway trucks, but of recent years modern packing sheds, with up-to-date grading and cleaning equipment, have been installed, and large quantities of good quality fruit, properly prepared for market, are being shipped in cool chambers to Europe. The oranges being exported are of a different type to those being handled in Australia, but come into direct competition with fruits from South Africa, being of a large size, with only fairly fine-textured skin, and of a colour varying from almost green to a light yellow. The Brazilian oranges are really juicy and quite sweet, and although the early ones are not of very attractive appearance, they are very good fruit because of flavour and juiciness.



Cool Vans for Meat Used on the Lines of the Electric Tram Company in Sao Paulo, Brazil, at the Frigorifico to Collect Loads of Meat.

Meat is loaded on the vans at the slaughtering works and delivered to depots in the city.

Oranges are grown so easily in much of Southern Brazil, water is plentiful for helping their growth, modern methods are being utilised in exporting the fruit the European market is relatively close, and they are so readily saleable in Europe, that a very considerable extension of orange-growing can be anticipated in the near future.

SUMMARY OF IMPRESSIONS GAINED IN SOUTHERN BRAZIL.

1. Southern Brazil, consisting of the States of Rio Grande do Sul, Santa Catharina, Paranà and Sao Paulo, covers about 316,870 square miles of territory.

2. The rainfall of the southern end is about 50in. on the average, but varies between very wide limits from year to year.

3. Brazil maintains about 43,000,000 cattle, about 11,000,000 sheep, and about 22,000,000 pigs, and most of these are to be found in Southern Brazil.

4. Most of the cattle slaughtered in the south of Southern Brazil are of British breeds, whereas most of those killed in Sao Paulo are of Zebu blood.

5. Most cattlemen are convinced that where the British breeds of cattle can be maintained, they should be, even if a lot of attention to them is necessary, but in rougher country, where the cattle tick is very bad, and other tropical diseases prevalent, the Zebu has no competitor.

6. Despite the improvements brought about for the preservation of meat, Xarque is still so useful in Brazil that the meat of over 1,000,000 cattle is preserved in this way annually.

7. The city of Sao Paulo, with a population of over 1,000,000 people, distributes her meat for local consumption on the electric tram lines of the city.

8. Oranges are becoming an important export line of Brazil, and they are grown so easily that a considerable extension in the industry in the near future seems inevitable.

CONCLUSIONS FORMED DURING TOUR.

The conclusions to be drawn from the investigations made during the tour of portions of the Southern Hemisphere with temperate and sub-tropical climate, are:—

1. Besides being a beautiful country, New Zealand is a remarkably good agricultural country, particularly as regards the production of dairy produce and sheep for meat.

2. In all probability the best pastures in the world are to be found in New Zealand, the natural conditions encouraging the full growth of pasture plants, and the farmers being extremely efficient managers of pasture lands.

3. The seed certification scheme, as inaugurated in New Zealand, and developed and controlled by the Department of Agriculture, is playing a great part in the improvement of New Zealand pastures.

4. The Meat Producers' Board of New Zealand has been functioning for 13 years, and so successful have its efforts been that it is the envy of most meat-exporting countries. Producers are adequately represented on this Board, for 5 of the 8 members are direct representatives of meat producers.

5. Co-operation is very important in the dairying industry of New Zealand, and it appears that much of the success attained in this branch of agriculture is due to this fact.

6. We have so much to learn from New Zealand in connection with pastures, dairying, fat lambs, and co-operation that officers of the Department of Agriculture should be sent more frequently than in the past to that country, to get first-hand knowledge of the progress being made.

7. Chile is a direct competitor with Australia with wines and barley, and although the agriculture is rather backward in some directions, has great potentialities for the production of all Mediterranean-climate crops. It appears however, that the development of her agricultural resources cannot be brought about quickly, and further she is handicapped in a similar manner to Australia in the time taken to place primary products on the European markets.

8. Argentina is such a wonderful agricultural country that she could, if allowed, swamp the markets of the world in which Australia is interested, with all the agricultural products which are produced in the temperate and sub-tropical portions of the Southern Hemisphere, except Merino wool.

9. The greatest competitor of Australia at the moment, Argentina is likely to become still greater as time goes on.

10. To be able to contend with the competition of Argentina, Australia is dependent upon the political advantage she has in being one of the units of the British Empire.

11. It will be necessary to extend the political advantage of Australia to enable her to meet the increasing competition from Argentina, and this can probably be done best by forming a close association with other outlying parts of the Empire, and more particularly those in the Southern Hemisphere, of which the most important are New Zealand and South Africa.

12. To encourage Great Britain still further to purchase Empire products in preference to foreign, an effort should be made to balance the trade to and from that country. Other things being at all equal preference should be given to the purchase of goods from the United Kingdom.

13. Although Uruguay maintains a fair number of sheep, and is an exporter of wool and sheep meat, it does not appear as though this country can ever develop into an important competitor of Australia with any agricultural product.

14. Southern Brazil exports a lot of oranges to Europe, and is constantly increasing supplies, but being of the type produced in sub-tropical climate, they do not compete directly with Australian export oranges.

15. Zebu cattle, and their crossbreds, are giving complete satisfaction in the tropical parts of Southern Brazil, and will probably do the same for the portions of Australia with similar climatic conditions.

16. Throughout South America livestock for slaughter are sold by live weight, a method which ensures that the producer gets paid for what he produces, and at the same time simplifies things for the buyer.

17. South Africa is a direct and important competitor with Australia with Merino wool, and it appears that her wool industry would be improved by the lifting of the embargo on the exportation of stud Merino sheep from Australia.

18. Everything possible should be done towards retaining the most friendly relationships with South Africa, for it appears that it will take the combined efforts of New Zealand, South Africa, Australia, and other parts of the Empire located in the Southern Hemisphere, to compete successfully with South America.

19. Arising from the tour of portions of the Southern Hemisphere is one conclusion which overshadows all others, and that is, that the competition now being faced by Australia from South American products will get greater and greater in the near future, and that the sooner steps are taken to combat it, the better. In this connection the following suggestions are made:—

(*a*) A serious endeavour should be made to balance the trade between the United Kingdom and Australia by purchasing goods made in Great Britain whenever possible.

(*b*) A close trade association between the parts of the Empire located in the Southern Hemisphere should be developed as soon as possible.

(*c*) To educate agriculturists in the needs, aims, production, and practices of the various parts of the Empire, an Empire Agricultural Convention should be organised to meet every year, or at least every second year, in one or other of the Empire countries.

(*d*) Australia, being dependent upon its agriculture, and the progress of agriculture being dependent upon selling overseas, every effort should be made to produce and prepare articles of a quality to retain any market once gained. This can be done by very rigid inspection to high standards of quality at ports of embarkation, and helped by attaching to all Departments of Agriculture a commercial branch to advise agriculturists on market requirements, current prices, co-operation, &c.

(*e*) To help counteract the wonderful natural advantages of South America, the cost of production of agricultural produce must be lowered, which can only be done by increasing the yield per unit. To do this agriculturists must be kept abreast of the times, and so a fully-staffed, efficient Department of Agriculture, including officers for field crops, horticulture, viticulture, veterinary science, cattle, sheep, pigs, wool, poultry, bees, irrigation, and marketing, must be maintained at all times.

(*f*) In South Australia, where manufacturing advantages are not great, the development by the people, of an agricultural outlook, would help maintain an export balance.

(*Concluded.*)

THE APPLE THRIPS (*THRIPS IMAGINIS* BAGNALL) IN SOUTH AUSTRALIA.

[By J. DAVIDSON, D.Sc., Waite Agricultural Research Institute, University of Adelaide.]

I. INTRODUCTION.

A widespread plague of the apple thrips occurred throughout the southern States of Australia during the spring of 1931. The insects infested apple blossom in large numbers during October; with mid-season and late varieties of apples there was consequently a poor setting of fruit. Bush and berry fruits, also garden flowers, suffered considerable damage.

There are no definite records of earlier plagues of thrips in this State; but there is little doubt that previous infestations have occurred, since outbreaks have been recorded in other States at intervals during the past 30 years.

Owing to the heavy losses in the apple growing industry, attributed to the thrips plague of 1931, an investigation of the thrips problem was undertaken as a co-operative enterprise between the Commonwealth Council for Scientific and Industrial Research, the Waite Research Institute of the University of Adelaide, the Thrips Investigation League and certain of the State Departments of Agriculture. The headquarters of the investigation were placed at the Waite Institute. An account of the research programme and details of the personnel of the investigation are given in the *Journal* C.S.I.R. (1933), p. 216. Articles dealing with various aspects of the work, written by members of the Thrips Research team, have appeared from time to time in that journal. The first annual report was published in the "Fruit World of Australasia," 1st October, 1933; the second annual report appeared in the same journal, 1st December, 1934. The present article reviews the position regarding the apple thrips problem in South Australia; it is based on information which has been established by members of the Thrips Research team, during the progress of the investigation.

We are indebted to the Horticultural Branch of the Department of Agriculture of South Australia for assistance in matters relating to orchard experiments and general field observations. Through the courtesy of Mr. G. Quinn and Mr. A. G. Strickland facilities were afforded us at the Government Orchard, Blackwood, where we received much help from the manager, Mr. R. Fowler.

Several orchardists offered facilities for experiments to be carried out on their properties; others co-operated by sending in samples of blossom infested with thrips for purposes of keeping records. In particular we owe a great deal to Mr. H. N. Wicks, of Balhannah, for the helpful assistance he has given us in all matters relating to our investigations. Mr. Wicks has maintained a close association throughout the progress of the work, and his experience and advice on practical matters, have been invaluable.

Finally, our warm thanks are due to Mr. E. Leishman, district horticultural officer, for his friendly co-operation and active assistance throughout the whole period that the investigation has been in progress.

II. DESCRIPTION AND LIFE HISTORY.

The apple thrips is a flower inhabiting species, apparently indigenous to Australia. It was first described by R. S. Bagnall in 1926 from specimens collected round Adelaide and Melbourne.

Several species of thrips inhabit blossom and flowers in association with *T. imaginis*; in particular, the common "onion thrips" (*Thrips tabaci*) closely resembles the apple thrips, and prior to 1926 the latter species was recorded as *T. tabaci*. During early spring, the "eucalyptus thrips" (*Isoneurothrips australis* Bagnall) commonly occurs in pear and stone fruit blossom.*

All thrips have a rather narrow, elongate body and relatively short antennae consisting of 6 to 9 segments. The adults (with the exception of certain species) have narrow wings, which extend to about the length of the body and bear a row of long setae along their margins; these setae give a fringe-like appearance to the wings, hence the name given to this group of insects, *Thysanoptera* (*thusanos*, a fringe; *pteron*, a wing). The immature stages of thrips are wingless.

The adult female of *T. imaginis* averages 1/20in. long and 1/100in. wide across the thorax; a stout, chitinous ovipositor is situated in the posterior end of the abdomen. The body, over the anterior portion, is golden-brown with a reddish tinge; the posterior area is brownish-yellow to a darker brown; individuals which have newly emerged from pupae are yellowish in colour, but gradually darken. The adult male is smaller than the female and lighter in colour, with a paler yellowish abdomen.

The immature stages consist of a first and second stage nymph, and a prepupa and pupal stage. These stages are illustrated in Fig. 1.

The essential features by means of which the apple thrips can be distinguished from its associate, the onion thrips, can be recognised with the aid of a hand lens. With *T. imaginis* a number of small, fine setae are found irregularly scattered over the ventral surface of the abdominal segments; with *T. tabaci* there is present in these situations only a single row of somewhat larger setae. With *T. imaginis* the ocellar crescents are red; with *T. tabaci* they are yellowish to brownish. The nymphs of *T. imaginis* are generally orange-yellow in colour whereas those of *T. tabaci* are lemon-yellow in colour.

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*An account of the common economic species of thrips found in Australia which includes species associated with *T. imaginis* is given by H. V. Steele (Pamphlet 54, C.S.I.R. (1935)).

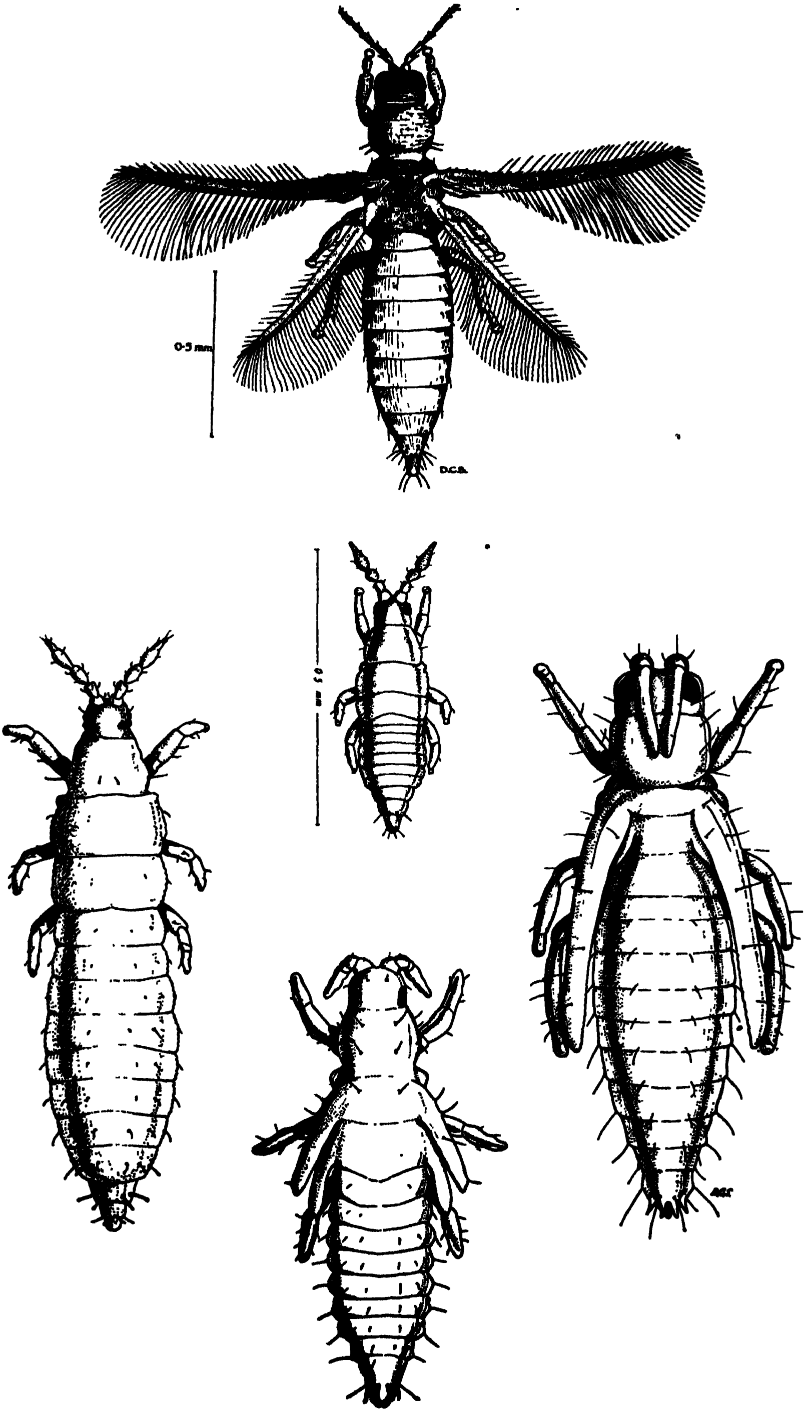


Fig. 1.

Showing all stages of *Thrips imaginis* Bagnall; first and second stage nymphs, pre pupa (male), pupa (female), adult female.

The life history of *T. imaginis* is simple. The female pierces the tissues of the flower with its ovipositor and deposits its oval, transparent eggs in the tissues; the eggs are laid in all parts of the flower, including the stamens and pistil. The newly hatched nymph (*first stage nymph*) is whitish, but soon becomes yellowish in colour; it feeds on the tissues of the flower destroying the epidermal cells with its piercing mouth parts and sucking out the juices from the cells. The *first stage nymph* moults and becomes the *second stage nymph* which is orange-yellow in colour. When the second stage nymph is mature, it leaves the plant and passes into the soil where it develops into the *prepupal stage*; this stage has short wing buds and can move about in the soil, but does not feed. The final stage or ***pupa*** has well developed wing buds; it remains more or less quiescent in the soil until the emergence of the adult.

Although two quasi-resting or pupal stages occur in *T. imaginis*, the degree of metamorphosis is ill-defined. Some authors refer to the first stage nymph as the "larva." The character of the metamorphosis resembles that found in the Heteroptera and it appears to be more appropriate to speak of the early stages as nymphs.

III. FOOD PLANTS AND HABITS.

The apple thrips inhabits the flowers of a wide range of plants. In spring it is common in fruit blossom, vines, grasses and garden flowers. Cape weed (*Cryptostemma calendulaceum*) and Salvation Jane (*Echium plantagineum*), which often flower over large areas in spring, may be heavily infested.

The insects feed on the delicate tissues of the flower; they lacerate the epidermal cells with their piercing mouth parts and suck out the contents of the damaged cells. The mouth parts are illustrated in Fig. 2. The head is prolonged into a mouth cone through which the piercing stylets are forced into the tissues. The stylets represent the paired mandibles and maxillae of other insects, but only one mandibular stylet is present; this stylet is considerably larger than the maxillary stylets.

During feeding, the stout mandibular stylet is forced into the epidermis, the cells being lacerated by the combined action of the three stylets. This causes a local accumulation of juices from the damaged cells. The mouth cone, which bears a number of sensory bristles, is now adpressed to the lacerated tissue and the juices are sucked up into the pharynx, from which they are passed along the oesophagus to the stomach. A secretion from the salivary glands passes along the salivary ducts into the chamber of the salivary pump; while the insect is feeding, the secretion is pumped from this chamber along the salivary canal to the wound in the plant tissues; when mixed with the plant juices it assists in the digestion of the latter.

Where the insects are feeding in blossom or flowers, the stamens, pistil, and petals may become dry and brown owing to oxidation reactions in the damaged cells, and loss of juices from the delicate tissues. The damage is greater during hot, dry weather, particularly with hot, north winds. Under these conditions extensive "browning" of flowers and blossom may occur and in some instances as with apple blossom they may fail to set fruit, owing to the destruction of the stamens and pistil.

In normal years only a few individuals will be found in apple blossom; during an infestation year, as in 1931, 150 individuals may be present in each blossom. The insects may occur in stone fruit blossom, pear and early flowering apple varieties if the spring is favourable for a thrips infestation. Normally early flowering apple varieties such as Cleopatra and Gravenstein have completed flowering before thrips are numerous; the mid-season varieties such as Granny Smith and Jonathan are more liable to infestation; the late varieties such as Rome Beauty and Buncombe invariably suffer damage in an infestation year. Bush and berry fruits, garden flowers and vines may suffer heavy infestation in November and December.

IV. FLUCTUATIONS IN NUMBERS THROUGHOUT THE YEAR.

T. imaginis may be found in flowers throughout the year in the Adelaide district, but the numbers fluctuate according to the favourableness of the period of the year. During the past four years daily counts have been made at the Waite Institute of the number of adult thrips present in roses. Graphs illustrating the numbers of *T. imaginis* are given in Fig. 3. The points on the curves represent the average number of individuals in one rose for 10 day periods.

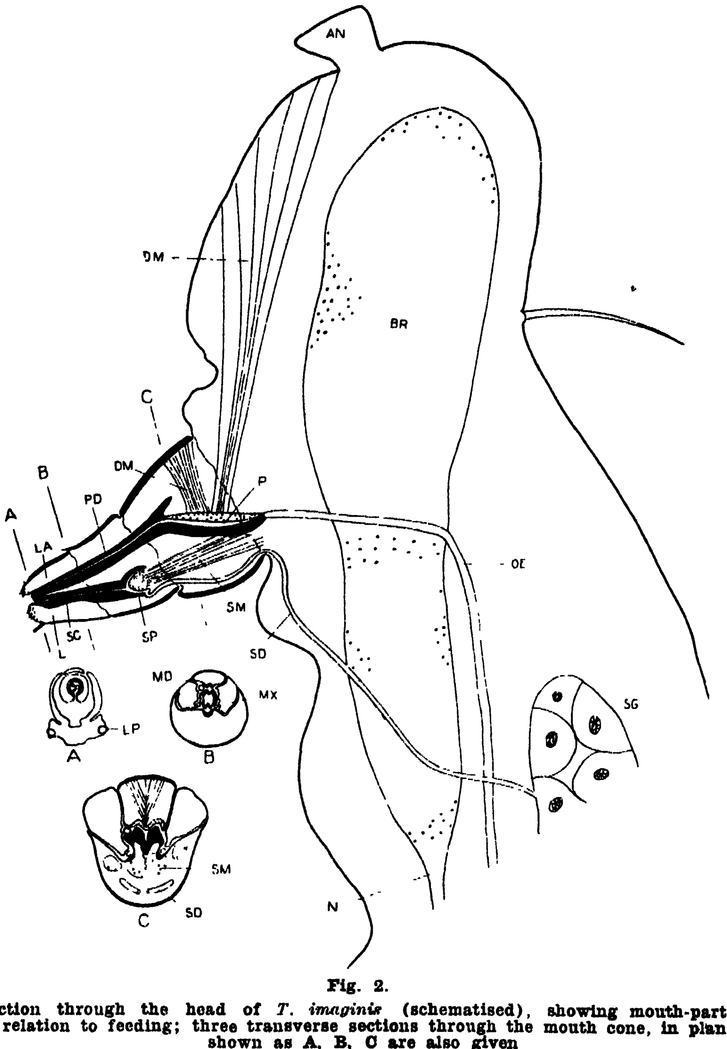


Fig. 2.

Section through the head of *T. imaginis* (schematised), showing mouth-parts in relation to feeding; three transverse sections through the mouth cone, in plane shown as A, B, C are also given

A. Section near tip of mouth cone; note stylets in section.

B Section through mouth cone, showing pharyngeal canal and salivary canal and portions of sclerites of the head; the maxillary stylets (MX) and mandible (MD).

C. Section through mouth cone immediately behind the salivary pump, showing pharynx.

BR, supra aesophageal ganglion or brain; DM, divaricator muscles of the pharynx; LP, labial palp; LA, labrum; L, labium; N, nerve; SG, salivary ganglion; OE, oesophagus; PD. pharyngeal canal; SC, salivary canal in hypopharynx; SP, salivary pump; SM, pump muscle; SD, salivary duct.

Commencing with the mid-summer period, thrips occur in small numbers during the hot, dry, summer months. This is associated with dryness of the soil, which is unfavourable for the pupal stages and causes heavy mortality; dryness also results in less flowers being available, compared with the spring period.

The number of thrips increases in the autumn, which is referred to as "the autumn rise." The extent of this increase is dependent upon the favourableness of the autumn weather, particularly rainfall which results in suitable soil moisture and growth of plants.

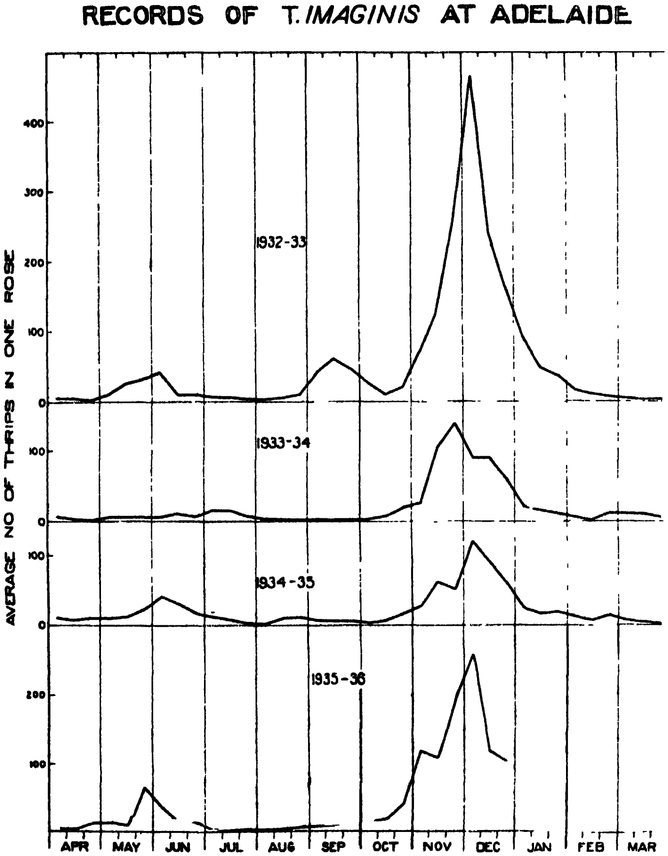


Fig. 3.

Showing fluctuations in the numbers of *T. imaginis* in the Adelaide district The points on the curves represent average number of individuals in one rose at ten-day intervals

As autumn advances into winter, the number of thrips decreases. This is due to low temperatures which retard development and restrict the activity of the adults. The insects pass the winter as pupae in the soil or as dormant adults in sheltered situations; some active individuals may be found in flowers, especially on warm sunny days.

With the advent of warm spring days, there is a marked increase in the number of active thrips. This is due to the emergence of adults from overwintering pupae and to renewed activity of dormant adults. The early spring rise in numbers is referred to as "the first spring rise"; it may occur early or late according to the favourableness of the prevailing weather, particularly temperature. The extent of the first spring rise depends upon the extent of the previous autumn rise, survival during the winter and the character of the prevailing spring weather.

The first spring rise is followed by a further increase in numbers, which is referred to as the "second spring rise." This rise is due to the development of a further generation of individuals following on the first spring rise. The date of its occurrence and extent depends upon the date and extent of the first spring rise and the favourableness of the spring weather. With the advance of the dry summer months the numbers of thrips decrease.

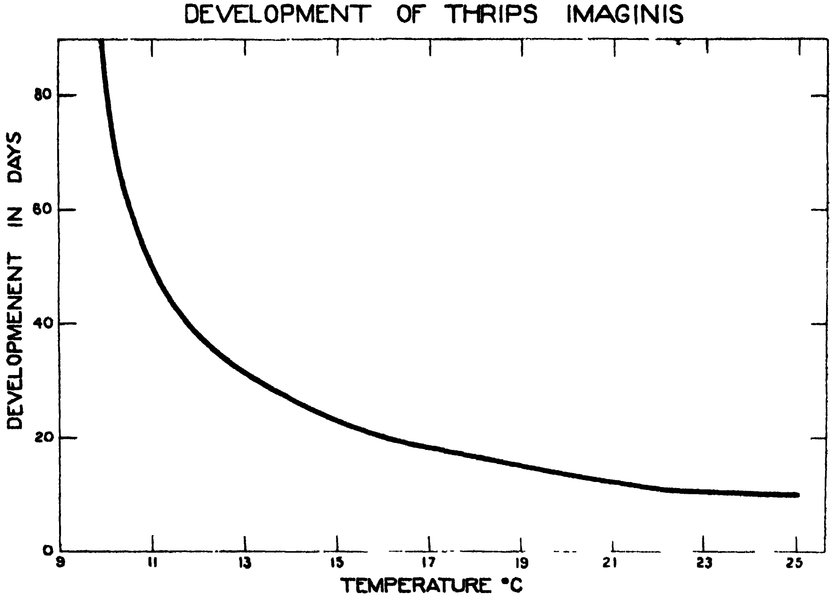


Fig. 4.

Curve showing approximate period required for the complete development of *T. imaginis* according to temperature during the period.

It is seen from Fig. 3 that the general trend of the fluctuations in the numbers of *T. imaginis* is the same every year, but the actual numbers present during the spring period varies from year to year. This is due to changes in the weather. In those years in which the weather favours a large increase in the numbers of thrips as a second spring rise, early in October, heavy infestation of apple blossom may be expected. With the development of a further generation of the insects during November or December, bush and berry fruits, garden flowers and vines may be heavily infested.

The following features of the biology of *T. imaginis* which have been established by experimental work during our investigations, illustrate the manner in which weather factors, such as rainfall and temperature influence the rate of multiplication of this insect.

When food and moisture are favourable, temperature is the major factor affecting the activity and development of *T. imaginis*. The insects are sluggish at temperatures below 10° C. (50° F.); they are very active when temperatures are about 21° C. (70° F.) and over, particularly when the weather is hot and dry.

The rate of development of *T. imaginis* in relation to temperature has been calculated from the results obtained with the development of 249 eggs at six different constant temperatures, and the development of 151 individuals reared from hatching to adult at five different constant temperatures. The theoretical temperature value at which development ceases (developmental zero) was found to be 9.3° C. (48.8° F.) for the embryo and 7.02° C. (44.6° F.) for the post-embryonic stages. By using the formula $D(T—C) = K$, where D = development in days, T = temperature and C = developmental zero, the value for K is 41.3° C. (74.3° F.) for embryonic development and 125-5° C. (225.9° F.) for post-embryonic development. The formula gives a good approximation to the developmental period at temperatures between 10° C. (50° F.) and 25° C. (77° F.).

A combined curve (Fig. 4) based on the above data, may be used for all practical purposes of determining the approximate period required for T. *imaginis* to pass through its life cycle at a given temperature.

The length of life of adults varies with temperature. At 8° C. (46.4° F.) females lived from 84 to 364 days; at 12.5° C. (54.6° F.) they lived on an average 138 days: at 23° C. (73.6° F.) they lived from 23 to 66 days. At the higher temperatures females appear to live longer than males; at 23° C. (73.6° F.) the average length of life of males was 31.5 days, while females lived on an average 45.7 days.

Egg laying activity is influenced by temperature. At 12.5° C. (54.6° F.) females began to lay on the 10th day after emergence from the pupa; at 16° C. (61° F.) oviposition occurred on the fifth day, at 20° C. (68° F.) on the fourth day and at 23° C. (73.6° F.) on the third day.

In a favourable environment, oviposition appears to go on steadily throughout the life of the female. The average number of eggs laid per day varied from 1.38 at 12.5° C. (54.6° F.) to 5.5 at 23° C. (73.6° F.).

The total eggs laid by a female throughout life varied from 186 at 16° C. (61° F.) to 251 at 23° C. (73.6° F.), but the difference in the numbers of eggs at these temperatures is not significant. At 8° C. (46.4° F.) on the other hand, only 18 eggs (average) were laid; the greatest number of eggs laid by one female at this temperature was 40. Two females maintained at this temperature, lived for 308 and 357 days respectively, but did not lay any eggs.

Food appears to have an important influence on fertility. With nine females feeding on stamens of Snapdragon (*Antirrhinum*) from which the anthers had been removed, an average of 19.8 eggs was laid; with females which were feeding on stamens complete with anthers, an average of 209 eggs was laid. The explanation of these results appears to lie in the high protein content of the anthers.

Apart from temperature and food, air humidity and soil moisture influence activity of the insects and the mortality rate. The adult insects are particularly active during hot, dry weather and may move about in swarms. They feed actively during these periods and obtain the necessary moisture from the tissues of the flowers of their food-plants: The pupal stages in the soil are susceptible to dryness since they do not feed and under drought conditions mortality is heavy.

V. SUGGESTIONS FOR CONTROL MEASURES.

The important weather features which favour the occurrence of the apple thrips in economic numbers in spring are early autumn rains and a wet autumn, followed by an early and sustained warm spring. The date of the occurrence of the "first spring rise" and its extent will be an important guide to the degree of infestation which may be expected during the spring. Where conditions favour the development of large numbers of thrips as a second spring rise early in October a heavy infestation of apple blossom may be expected.

The thrips will be widely distributed over the infested area. They will move avtively on hot, dry days and infest flowers and blossom. With most varieties of apple the thrips enter the buds at the base of the petals, before the buds open; they damage the stamens and pistil; if thrips are numerous, the blossom may not set fruit. They also feed on the exposed portion of the petals, causing them to turn brown. When the buds open, the insects continue to infest the blossom.

During a heavy infestation, it is impracticable to aim only at killing the thrips infesting the blossom, since the insects are abundant over a wide area. The aim should be to drive the thrips out of the blossoms, and protect the latter during the critical periods of the invasion by the application of suitable dusts or sprays. It is important to anticipate movements of the thrips, and suitably time the application of the insecticide. It is best if the protective cover can be applied when an invasion is imminent, which will normally occur during hot days.

During the period that the Thrips Investigation has been in progress, the numbers of thrips in the spring have been too small to allow of adequate field trials being made with insecticides. By means of laboratory and restricted field tests, certain insecticides have been selected for extended field trials when the opportunity offers. Until results from adequate field trials have been obtained, a definite opinion cannot be given regarding the efficiency of the following insecticides under field conditions.

(*a*) TREATMENT OF UNOPENED BUDS.

Spraying or dusting as for open blossoms (*b*) may be used. A finely-ground substance like kaolin, applied as a wet spray, to which a spreader has been added, may form a temporary mechanical barrier over the openings into the buds, and prevent the entrance of thrips. The spray is cheap and harmless, and may be applied in heavy doses. We have had insufficient field experience with this method to enable us to make any recommendation at present. The spray is of no use applied to open blossom.

(*b*) TREATMENT OF OPEN BUDS.

The aim should be to apply an insecticide which will drive thrips out of the open blossom, and keep them out during critical hot days. Dusts are convenient for this purpose, and the formula given below has given promising results with small tests:—

	Per cent.
Kaolin or talc	80 or 70
Derris (finely-ground)	15 or 20
Pyrethrum (finely-ground)	5 or 10

Derris and pyrethrum repel thrips; they gradually lose their toxic properties on exposure to air and sunlight. In orchard practice, it is not expected that the dust will be effective for more than two days after application to the trees. Further applications will be required as necessary. Dusts having the higher concentrations of derris and pyrethrum will be more efficient, but more costly. The formula is based on ground derris root, of which about 90 per cent. passes through a 200-mesh sieve, and containing 3.5 per cent. rotenone; the pyrethrum used contained 0.2 per cent. pyrethrins. A hand rotary or knapsack duster can be used for small areas; a larger machine will be desirable for extensive areas; a suitable allowance of dust is ½lb. per tree. Where derris cannot be obtained, a pyrethrum dust may be used, but its efficiency will be considerably less than a dust containing both derris and pyrethrum.

We have had little success up to the present with experiments with sprays. It is recommended that dusts should be used wherever possible.

For growers who desire to use a spray, the following formua is suggested:—

Finely-crushed derris root	2lb.
Soap	5lb.
Water	100galls.

This spray can be made up by the grower; it must be prepared fresh, immediately before use, since it deteriorates in efficiency on standing.

Oil emulsions containing derris and pyrethrum appear to be more promising than aqueous sprays, but the work in progress on these emulsions is still in the experimental stage.

The dust formula given above may be used for bush and berry crops and for garden flowers.

Although the damage to apple blossom caused by thrips may prevent the normal set of fruit, other factors appear to be associated with the irregular setting of fruit. The type of weather which favours a spring thrips infestation may not be favourable for the setting of fruit. With a wet cold winter followed by an early warm spring the roots may not be able to supply the shoots adequately with nutrients; hot north winds at blossoming time may affect chances of pollination; variation in the viability of pollen in fruit blossom in different years is an important consideration.

REFERENCES.

Further information relating to studies on *Thrips imaginis* will be found in the references given below, which consist of papers written by members of the Thrips Investigation Research team. The information relating to results of experiments, which are embodied in the present paper, has been abstracted from these publications:—

Andrewartha, H. G.: 1934, Journ. C.S.I.R. 7, 239; 1935, 8, 281; 1936, 9, (in press).

Andrewartha, H. G. and Steele, H. V.: 1934, Journ. C.S.I.R. 7, 235.

Davidson, J.: 1933, Fruit World of Australasia 34, 555; 1934, 35, 255, 667; 1935, Journ. C.S.I.R. 8, 234.

Evans, J. W.: 1933, Journ. C.S.I.R. 6, 145; 1934, 7, 61; 1935, 8, 86.

Steele, H. V.: 1935, C.S.I.R. Pamphlet No. 54.

Wheeler, H. W.: 1934, Journ. C.S.I.R. 7, 70.

RAISING EXPORT PIGS WITH BARLEY AS PRINCIPAL FOODSTUFF.

[By W. J. Spafford, Deputy Director of Agriculture.]

South Australia is rapidly becoming an exporter of pig carcasses to the United Kingdom, and the quality of the meat sent overseas during the past couple of seasons is such that it is bought quite readily. The satisfaction given to overseas buyers of South Australian pork makes it appear that almost unlimited expansion of the pig-export industry can be brought about, provided that only good quality carcasses are shipped. The possibilities of the pig-export industry are very great indeed, because an enormous demand, now largely supplied by foreigners, exists in Great Britain, and cheap grain, suitable for the production of the highest class of pork for conversion into bacon, is grown very cheaply in this country.

BARLEY A GOOD PIG FOOD.

Much of South Australia is well suited to the production of barley, as well as wheat, and even although no serious effort has been made to encourage the growth of barley, the surplus grain of this cereal over and above that required for local malting and brewing is now very considerable, and so far it has been impossible to find an overseas market for more than a portion of the overplus. On the other hand the overseas market for frozen pig carcasses, of a type that will make good bacon, is becoming better and better for Empire countries, and there is no grain which will produce better pork for bacon-making than barley, if used judiciously. The firmness and whiteness of fat, and deneness of the texture of the meat produced when sufficient barley is used in the ration supplied to pigs, is well known to pig feeders and bacon manufacturers, and at present market values it is doubtful if there is any other way to sell barley to greater advantage than if converted to pork.

SOUTH AUSTRALIA IS A FAVOURED COUNTRY FOR THE REARING OF PIGS.

The climatic conditions obtaining in most of the cereal-growing districts of South Australia are almost ideal for the production of pigs with the minimum of artificial protection. Given access to a plentiful supply of water, and provided with a simple sort of shade, such as a low-set brush shed, pigs thrive in most parts of the country.

No serious diseases of pigs are virulent in South Australia, and with ordinary care most pigs dropped are economically reared to marketable size.

Added to the favourable climatic conditions is the advantage attached to cheap grain, for there are few countries in the world which can produce barley and wheat at a lower cost than is done in this country.

THE OVERSEAS MARKET FOR PIG CARCASSES.

As far as Australia is concerned there is only one important overseas market for pig products, and that is the United Kingdom. Between £50,000,000 and £60,000,000 sterling worth of pig products are imported into Great Britain annually, and the great bulk of these are sent from foreign countries. Besides other pig products the United Kingdom imports annually about 9,000,000cwts. of bacon and hams, and almost 1,300,000cwts. of pork. Of bacon and ham about 8,000,000cwts. are secured from foreign countries, whilst almost all of the remainder comes from Canada. Of pork, foreign countries supply about 607,000cwts. and Empire countries about 678,000cwts., and of this latter figure Australia only provides about 82,000cwts.

It has been proved definitely that first-class bacon can be manufactured in Britain from carcasses received in a frozen state from Australia, provided that they are of the right type, and that the pork from frozen porkers thaws out well and sells readily, and so it should be possible to secure a share of this enormous trade in pig products. To be able to do this profitably it will be necessary to produce the type of pig welcomed by British buyers, and not to expect the consumers to pay high prices for something they are not at all keen on, and which is consequently unsuitable for the trade. That they will not do this is amply illustrated by what happened a short while ago to a consignment of a thousand South Australian pig carcasses sold in London on behalf of a local exporter, in which case the carcasses of the required type brought 5½d. per pound, whilst others of the same weight, but carrying much too much fat, realised the low price of 2¾d. per pound.

THE TYPE OF PIG REQUIRED IN GREAT BRITAIN.

It was only a few years ago when the term "British pork" meant "fat pork," but that has been changed, and now-a-days the high-priced bacon and pork eagerly sought in the British markets is of a very lean type, and anything showing much fat is sold at a really low price. In this direction public taste has become very fastidious in favour of lean pork and bacon, and if South Australia is to secure a place in this wonderful market it will be necessary to produce an article of the type required.

Although the change from the attraction of very fat pig products to a fancy for lean pork and bacon came about many years ago in Great Britain, the tradition persisted for some time in this country that the ideal pig was a short, dumpy animal, broad of back, round and heavy in the hams, and carrying a relatively high proportion of fat, and it is only in the last few years that a noticeable change has taken place. Even for local requirements, present-day sales show a strong preference for the properly finished lean type of porker and baconer, and whilst free choice is possible, nearly twice as much per pound is paid for long-bodied, deep-sided pigs as for short animals of equal weight, but carrying the amount of fat that was insisted upon only a few years ago. The popular pig of to-day would have been considered to be in forward store condition in days gone by, and no one would have thought of killing such an animal for bacon or pork.

Although it is *important* to send pigs to local markets in this old-time "forward-store" condition if it is hoped to obtain anywhere near top prices, it is *essential* to produce this type of pig if any increased numbers of carcasses are to be successfully marketed in Great Britain.

To suit the requirements of the British market the type of pig and the condition carried are similar whether for the porker or baconer trade, the only difference being that of weight of carcass, and this type is described in the recent publications on the subject of the *British Ministry of Agriculture and Fisheries* as:—

Head with jowl and neck should be light. This portion consists largely of bone and is therefore of low value, and on that account requires to be light, and should not carry rolls of coarse fat at jowl or over the neck.

Shoulders and fore-end must be light and free from wrinkles and coarseness. The "collar" containing overlapping muscles and much gristle is a cheap cut.

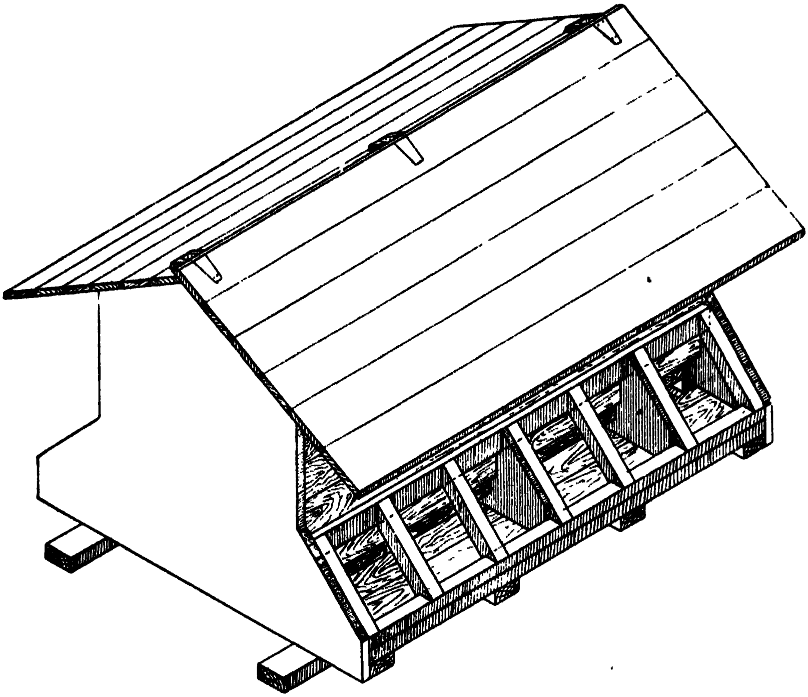
Back must be long and level because the middle of the carcass fetches the highest price per pound. Length means quantity of the most valuable portion, and a level back means weight and depth of loin. The fat on the back should not exceed 1½in. in thickness in baconers, and should be considerably less in porkers.

Sides should be level and moderately deep. Distension of the lower part is often accompanied by thin belly cuts, and disproportionate primary offals. Moderately deep sides afford good depth of prime back cuts and under cuts.

Underline must be straight as it denotes that the "thin streaky" and "flank" cuts are not unduly distended and thin.

Belly should be thick in the flesh, as the value of lower cuts is increased by thickness.

Flank should be thick, handle firm, and be in line with the sides.



—— ISOMETRIC VIEW OF PIG SELF-FEEDER. ——
—— TO SHOW SIDE AND BRACINGS ——

A Self-feeder for Pigs for Use in the Field.

Where pigs are being fattened in paddocks, self-feeders are invaluable. To produce good-type market pigs from the breeds or crosses which tend to fatten to too great a degree the animals should be fed from troughs until being "finished" for market. By following this method they can be compelled to grow without becoming excessively fat. For the leaner types of pigs self-feeders can be used most of the time.

Hams must be broad, wide, and deep to hocks, as these characteristics denote plenty of flesh. There should be no depression between the hams at the root of the tail, as this indicates excessive fat.

Tail should be set high as it is held that it denotes a higher proportion of flesh than if set low; on the other hand a tail set too high frequently denotes an excess of back fat.

Legs should be set wide apart, and the pig should stand well up on the tips of the toes.

Bone must be fine, as it indicates quality and does not detract from weight.

Skin should be free from coarseness and wrinkles.

Hair should be fine.

Colour may be anything, but the trade prefers white pigs.

Weights should range between 160lbs. to 225lbs. live weight (120lbs. to 170lbs. dressed weight) for baconers, and 85lbs. to 120lbs. live weight (60lbs. to 90lbs. dressed weight) for porkers.

Good conformation does not necessarily connote good quality of meat, which is largely dependent upon feeding. Breeding exerts the great influence on general conformation, and feeding on the quality of the flesh. Feeding determines the colour and texture of the flesh, and to some extent the quality of the bone.

DEFECTS COMMONLY FOUND IN CARCASSES.

The defects which are most common in carcasses received by English bacon factories and butchers are as follows:—

Short Middle.—Great differences are found in the length of side, and it is not unusual for sides of the same weight to vary 4in. or even more in the measurement taken from top of the first rib to the end of the round bone. The proportion of the valuable middle cuts is much greater in the longer sides, and the shorter sides are heavier in the shoulder and carry thick back-fat.

Excess of Fat.—Sides which contain heavy excess of back-fat are almost unsaleable. If the back-fat is thick the whole carcass is similarly affected.

Soft Fat.—The presence of soft fat is usually an indication of wrong feeding methods. Many distributors hold that the solidity of the fat is a conclusive test of quality, and that the belly-fat affords a better test than the back-fat.

If the fat is firm and white, the bacon will be of the highest quality.

Heavy Shoulders.—A coarse framework of bone at the shoulder, with its accompanying weight of flesh, and particularly if accentuated by too much fat, makes its sale very difficult.

Thin Belly.—Unduly distended bellies are so stretched that the rashers cut from "flank" and "thin streaky" are excessively narrow.

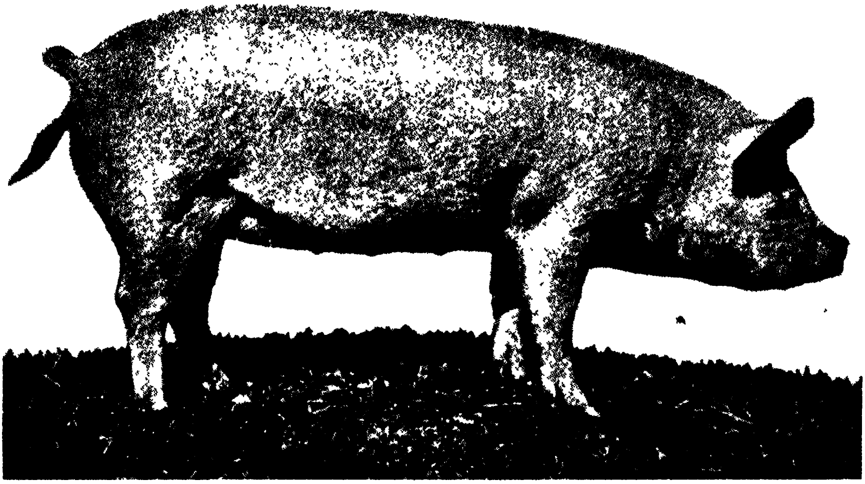
Seedy-cut.—Seedy-cut, which is a pigmentation about the milk ducts, is usually found in the female progeny of black boars; it is not in itself harmful, but, owing to its objectionable appearance, the parts affected must be removed from the side before sale. Apart from disfiguration, this may mean the removal of 7lbs. or 8lbs. of bacon from a valuable portion of the side. Seedy-cut can be avoided by using a white boar.

MEASUREMENTS OF IDEAL CARCASSES.

In discussing the judging of bacon by a standardised chart of measurement, in the Silver Jubilee number of Empire Pork Review, Mr. John Hammond, F.R.S., Professor of Agriculture, Cambridge, says, amongst other things:—

The weights of carcasses in greatest demand are those from 140 to 170lbs. for the Wiltshire side trade, which forms the bulk of the bacon consumed in England. Bacon may be made from heavier or lighter carcasses than these, but it does not command the highest price and has only a limited sale.

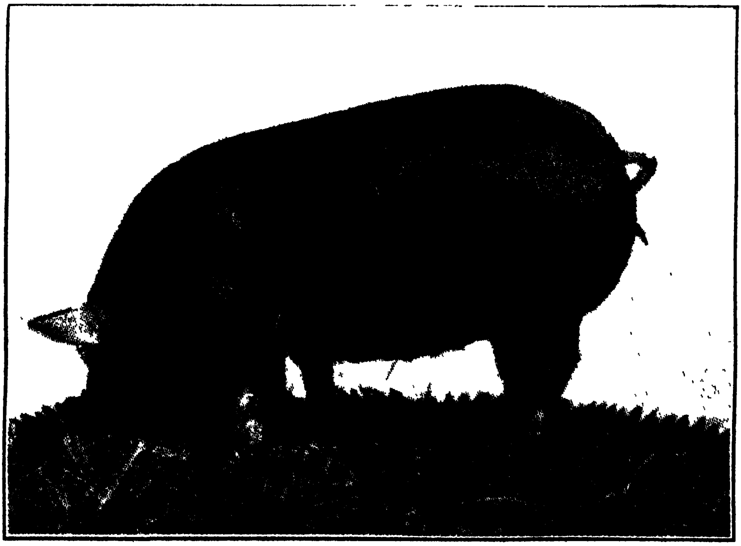
Length of side, thinness of back fat, and thickness of streak (belly), are the three main points which can be measured in commercial carcasses to be made into bacon, for they do not involve cutting through the side.



An Ideal Type of Pig for Present-day Market Requirements.

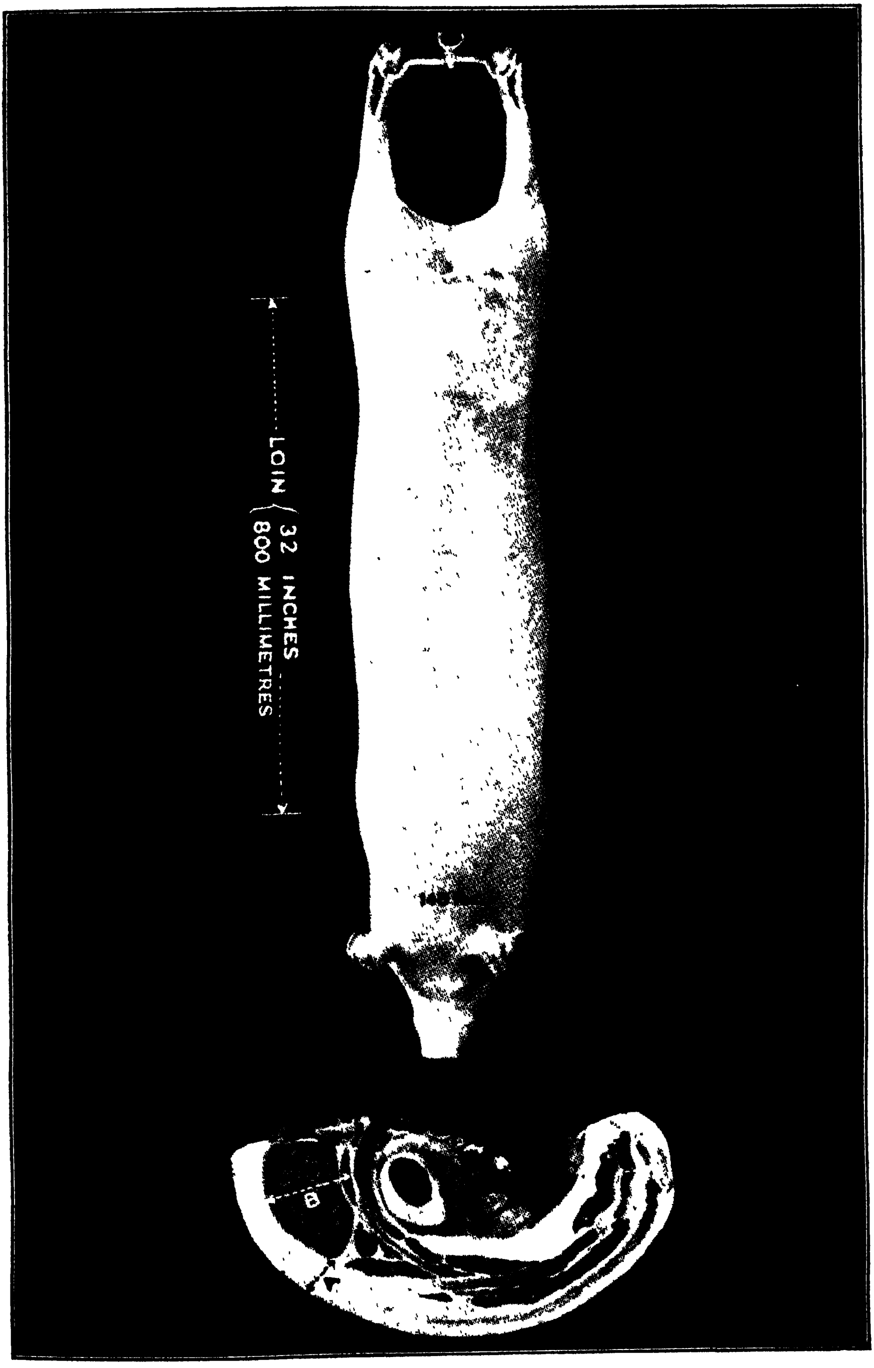
The fat bacon and pork, which had ready sale in Great Britain a few years ago, is only saleable at low prices at present, for fashion has changed towards a well-finished pig of a relatively lean type. Market pigs must be long and deep of body, with nicely rounded hams, light and fine at the shoulders, and possess relatively small heads.

The animal illustrated fulfils all of the requirements of both the British and local markets, and if South Australia is to capture a noticeable share of the overseas trade in pig products pigs of this type must be bred and reared in large numbers



A Market Pig of Incorrect Type Either for Bacon or Pork.

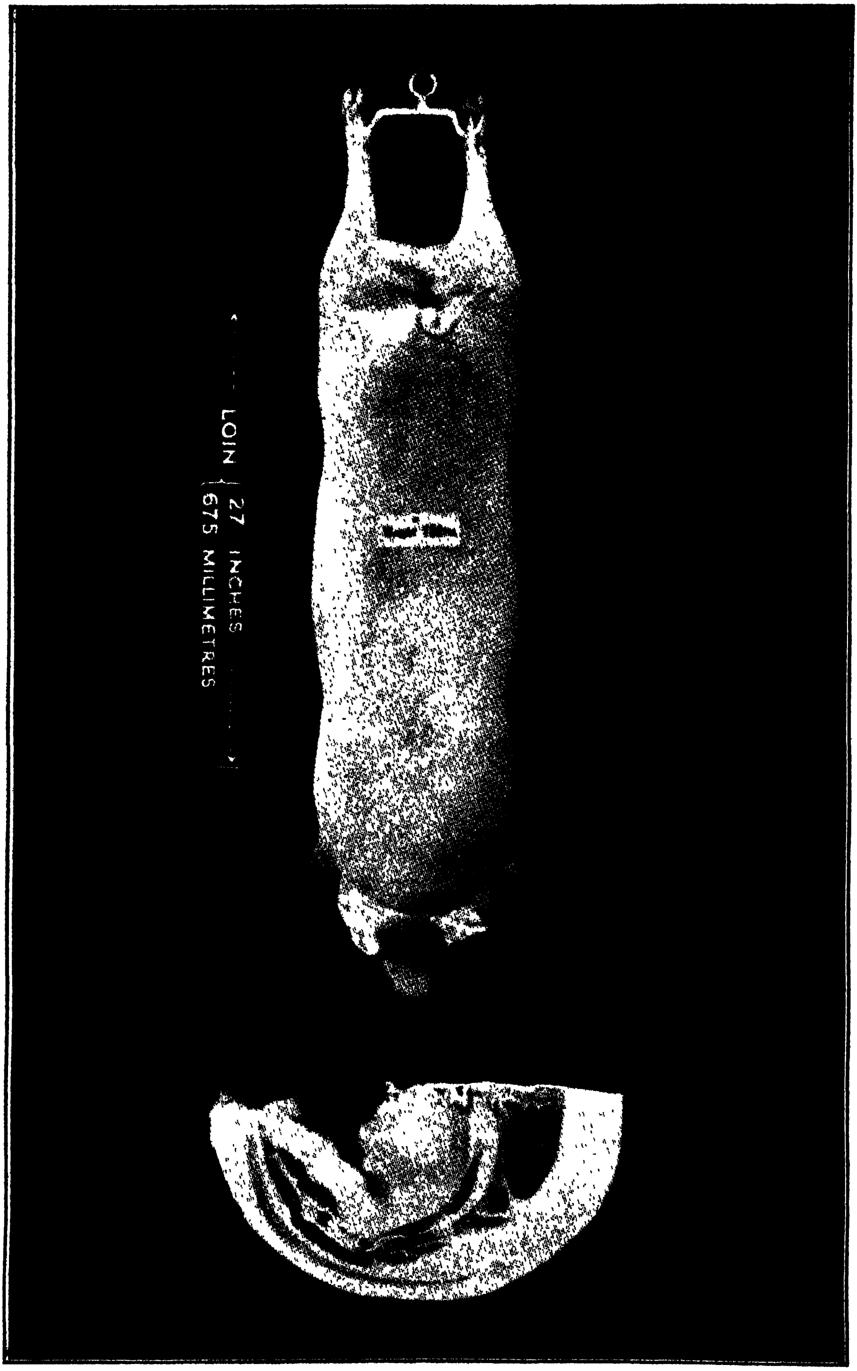
The short, dumpy pig, broad of back, round and heavy in the hams, and carrying a relatively high proportion of fat, no longer sells well in either British or local markets.



[From *Empire Pork Review—Silver Jubilee Number.*

An Ideal Baconer.

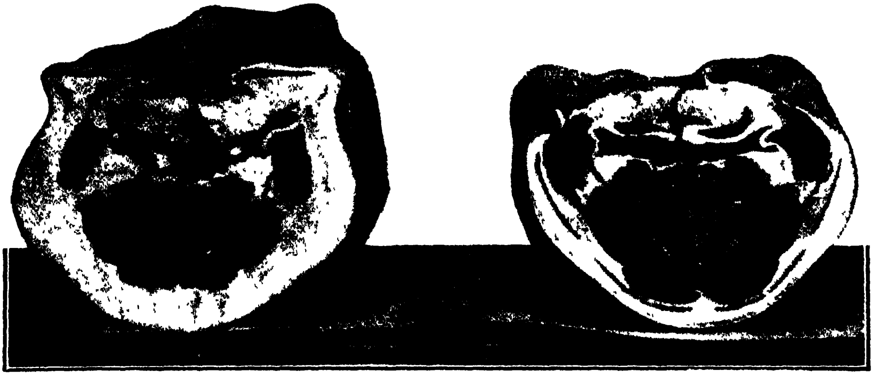
Such a carcass is ideal for present-day British requirements, the length between the round bone and the first rib being 32 inches, the thickness of the "eye" of meat (B) being 2¼ inches, and the fat at base of the "eye" of meat (A) being only 1 inch thick.



[From *Empire Pork Review—Silver Jubilee Number.*

An Unsuitable Baconer.

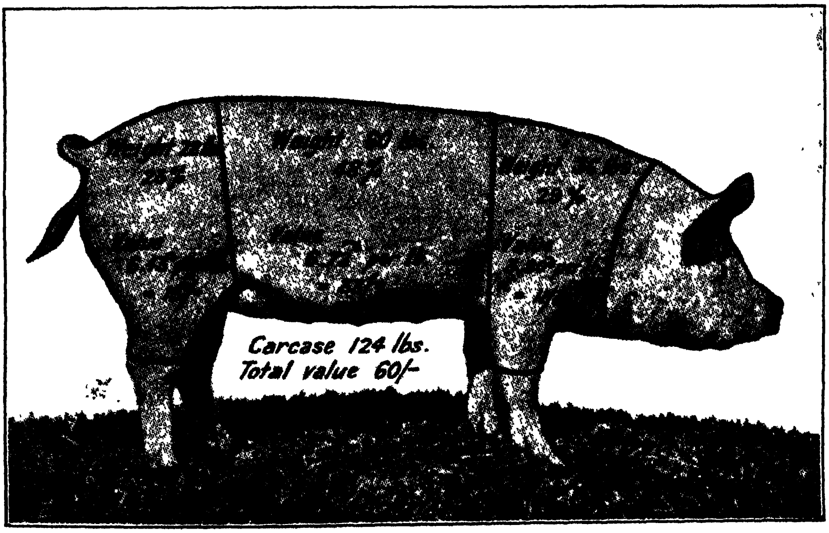
Such short, dumpy carcasses (27 inches between round bone and first rib) are not favoured in Great Britain. The cross-section shows a thin "eye" of meat, and lots of fat.



[From *The Pig Industry*, by R. B. Kelley.

Lean Pig Meat Preferred.

The illustration on the right shows the high proportion of lean to fat desired to-day, whilst that on the left shows the once popular quality, which is now considered to be much too fat, and so is of low market value.



Why Pigs with Long, Deep Bodies and Light Forequarters have High Market Value.

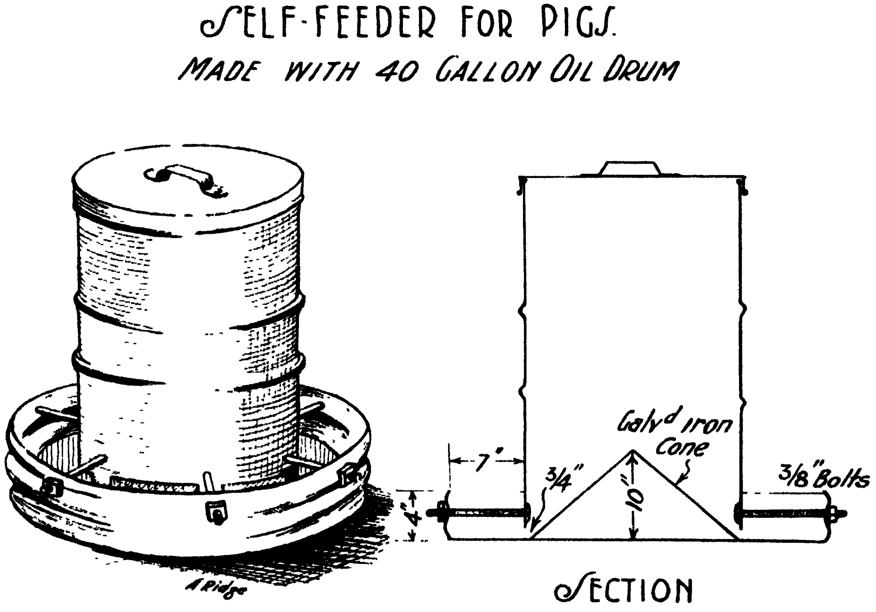
Nearly half of the weight of the ideal market pig is in the middle section, and as the average price of this section is higher than that of either of the other sections, this portion is worth considerably more than half the total value of the carcass. The lighter the forequarters the better, because the market value of this section is so low.

Note.—The weights of the sections and their relative values are taken from "Pig Keeping" (Bulletin No. 32 of the Ministry of Agriculture and Fisheries, London), whilst the total value is the actual price at Adelaide Abattoirs on 8th January, 1936, for good pigs of the weight shown.

Length for Weight.—A good standard carcass (150 to 159lbs.) should measure 820 mms.* (32½in.) or more from the pelvis or head of the femur (round bone) to the first rib. For each increase of 10lbs. carcass weight above 150lbs. the length should increase by 20 mms. (¾in.).

Thinness of Back Fat.—The thickness of the back fat is greatest over the shoulder, thinnest over the last rib, and intermediate between these two over the rump. In a good, standard carcass the fat should taper down from the shoulder (40 mms. or 1½in.) to the last rib (22 mms. or ⅞in.).

Thickness of Streak.—This is taken in conjunction with thinness of back fat. The streak can be made thick by increase in the thickness of the lean meat, or by the addition of fat. It is the former which is required, so that where the carcass cannot be cut through to see the composition of the streak, the thickness of the streak is judged only in relation to the thinness of the back fat. Where the thickness of the back fat is right a good standard carcass should measure 40 mms. (1½in.) and increase by 1 mm. for each 10lbs. increase in carcass weight. A good estimate of the thickness of the lean meat in the streak can be obtained by subtracting the thickness of the back fat at the last rib (22 mms.) from the thickness of the streak (40 mms.), which leaves the balance (18 mms.) as an estimate of the lean. If the back fat is thick (30 mms.), at the same streak thickness (40 mms.) the measure for the lean would be less (10 mms.).



Self-feeder for Pigs Made with 40-gallon Oil Drum.

Forty-gallon oil drums make effective self-feeders for pigs, and are easily moved from one position to another in the fields. Anyone with a little experience in plumbing can construct a serviceable self-feeder from an oil drum, a few bolts, and a little galvanized iron.

Mr. Hammond continues by stating that if the side can be cut through before judging, then the thickness of the lean meat can be measured directly by taking the *thickness of the "eye" of the loin* from a cut made at the last rib. This position is selected because it is the most valuable cut and because it is the latest maturing part of the body, so that if the thickness of the lean meat is right here it will be elsewhere. The "eye" in a good standard carcass should measure 55 mms. and increase 1 mm. for each 10lbs. increase in the carcass weight.

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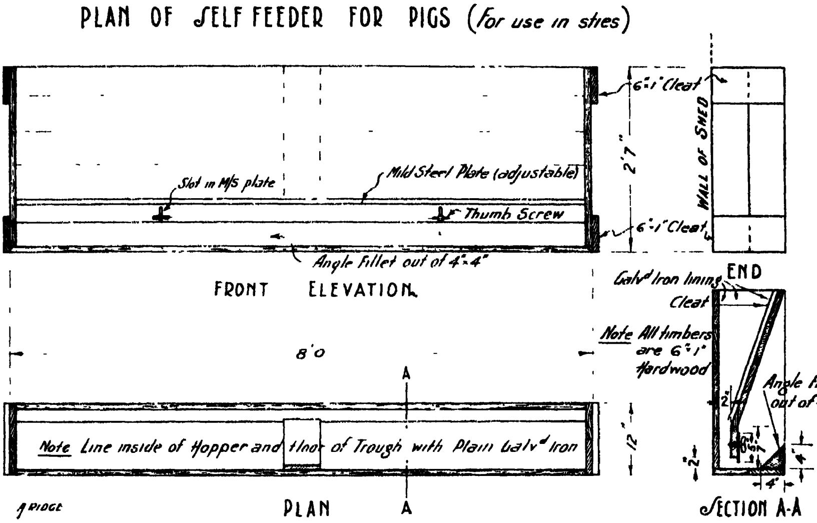
* 25 millimetres to 1in.

PRODUCING THE PROPER TYPE OF PIG.

If South Australia is ever to become the important pig-breeding country its natural advantages of favourable climate and plentiful supply of suitable grain appear to indicate, pig carcasses must be exported to Great Britain. If the British market for pig products is to be successfully exploited only the very best quality of carcasses must be exported. To produce the type of carcass required in Great Britain, breeders must realise that the type of animal that has been generally popular until quite recently, and is still so with some pig-keepers, must be replaced by a different-shaped animal. Short, dumpy, fat pigs are of low value in Britain, and at present prices are unprofitable to export. The type of pig which brings top market prices overseas is a long, lean, rangy animal, deep in the side, light in the head, neck, and shoulders, straight on the underline, with well developed hams, of a white colour, and in a condition which was generally looked upon in this country as *forward store condition.*


PLAN OF SELF FEEDER FOR PIGS (for use in sties)
6"×1" Cleat
Slot in M/S plate
Mild Steel Plate (adjustable)
Thumb Screw
6"×1" Cleat
WALL OF SHED
2'7"
Angle Fillet out of 4"×4"
FRONT ELEVATION
END
Galvd Iron lining
Cleat
Note All timbers are 6"×1" Hardwood
8'0
A
Angle Fillet out of 4"×4"
2"
Note Line inside of Hopper and Floor of Trough with Plain Galvd Iron
12"
2"
4"
4"
J RIDGE
PLAN
A
SECTION A-A

Plan of Self-feeder for Pigs (for use in Sties).

Where large numbers of pigs are to be fattened in sties, it is essential to provide self-feeders to keep down costs of feeding. The simple self-feeder here shown is very effective when crushed grains are the principal foodstuffs used, and considerably reduces the cost of production.

The right condition is developed by careful feeding, and is particularly helped by allowing the youngsters plenty of freedom and exercise until they are getting close to marketing weight. Leanness resulting from under-feeding is not the kind of condition desired.

The great bulk of the pig carcasses imported by Britain for which top prices are secured are sired by Large White boars and there is no breed so suitable as sires for this purpose, because of the high proportion of animals of correct type got by them.

Almost any prolific, roomy sow is suitable to mate with a Large White boar to produce pigs which will grow into export animals if fed correctly, but of the sows usually available in this country the order of preference would be something like:—

1. Half-bred Tamworth-Mid York.
2. Half-bred Tamworth-Berkshire.
3. Tamworth.
4. Canadian Berkshire.
5. Half-bred Berkshire-Mid York.
6. Mid York.
7. Berkshire (old type).

UTILISING BARLEY TO BEST ADVANTAGE.

Best results are obtained from the feeding of barley to pigs if the grain is thoroughly crushed, but it is not always economical to go to the expense of crushing. If not crushed the grain can be soaked with water, or fed dry and whole. The relative feeding values of various treatments of barley for pig feeding are somewhat as follows:—

4lbs. of ground barley will produce 1lb. of live weight of pig.
4½lbs. of soaked barley will produce 1lb. of live weight of pig.
5lbs. of dry, whole barley will produce 1lb. of live weight of pig.

To soak the grain properly, just the quantity of water which the grain will absorb should be used, and never an excess of water. All of the barley put into soak one day should be used within 24 hours, and vessels used for soaking should be thoroughly cleaned every day.

No advantage is to be gained by cooking barley for pigs.

Wherever possible barley should be fed to pigs in conjunction with skim milk and greenfeed, but if no skim milk is available a pig meal or meat meal of some kind should be used.

After the experimental work conducted at Turretfield Experimental Farm, with the feeding of barley to pigs, Professor Perkins recommends:—

1. Where Skim Milk is Absent, but Greenfeed is Procurable.

For sows with average-sized litters, 6½lbs. of crushed barley and 1½lbs. of pig meal should be fed daily for the first week. The daily allowance should be then increased each week by about 1½lbs. of crushed barley until weaning time. Throughout the period sufficient greenfeed or roots should be supplied.

Young growing pigs should receive per day:—

50lbs. live weight	2lbs. crushed barley, ½lb. pig meal
60lbs. live weight	2¾lbs. crushed barley, ⅝lb. pig meal
70lbs. live weight	3½lbs. crushed barley, ⅝lb. pig meal
80lbs. live weight	4¼lbs. crushed barley, ⅝lb. pig meal

2. Where Skim Milk and Greenfeed are Available.

Porkers (80lbs.); 1½lbs. crushed barley and 3lbs. pollard; or 2¼lbs. crushed barley and 2¾lbs. bran; or 2lbs. crushed barley and 2lbs. crushed peas.

Light Baconers (150lbs.); 2lbs. crushed barley and 5lbs. pollard; or 3½lbs. crushed barley and 4lbs. bran; or 4lbs. crushed barley and 2¼lbs. crushed pease.

Heavy Baconers (200lbs.); 3lbs. crushed barley and 5½lbs. pollard; or 4½lbs. crushed barley and 5lbs. bran; or 5lbs. crushed barley and 2¾lbs. crushed pease.

STANDARD RATION FOR PIGS.

In feeding tests conducted at Roseworthy Agricultural College the standard ration consisted of:—

Crushed barley	8 parts
Crushed wheat	4 parts
Crushed pease	2 parts
Meat meal	1 part
Greenfeed	12 parts

MINERALS FOR GROWING PIGS.

It is generally recognised that more rapid gains in live weight and the general health of growing pigs, are secured if some minerals are added to the foodstuffs being supplied. On this matter, Mr. Alan H. Robin, B.V.Sc., Government Veterinary Officer, makes the following remarks:—

Mineral matter is of the greatest importance to young growing pigs, being required for the maintenance of vital body functions and the growth of sound bone. It also assists in the building up of the food proteins into muscular and other body tissues. A deficiency of it leads to unthriftiness, poor development, and the occurrence of disease such as depraved appetite, paralysis, and rickets. So if they are to remain healthy and make rapid growth their diet must contain supplies of it ample for their needs. While all foodstuffs contain various minerals required by pigs, the amounts present vary very considerably, *e.g.*, some foods are rich in calcium, others are poor in it, &c. Should there be any danger, therefore, of the ration supplied being short to any serious extent of the animals' requirements of them, then a mineral supplement should be fed in order to make good the deficiency.

The only mineral constituents that are ever likely to be lacking to any serious extent in rations fed ordinarily to pigs from weaning to marketing condition are Calcium (lime), Phosphates, and Common Salt ($NaCl$).

If it is desired to provide the necessary minerals in the form of a mixture, the following will fully supply the need:—

Ground limestone or agricultural lime	2 parts
Bonemeal or dicalcic phosphate	2 parts
Common salt	1 part

One pound of the mixture to be added to every 40lbs. of dry foodstuff being supplied to the pigs.

There is no advantage to be gained from the addition of iron, sulphur, iodine, &c., to mineral mixtures for pigs.

It is necessary to point out, in conclusion, that an adequacy of minerals in the diet of growing pigs is not of itself sufficient to ensure good results; the animals must also have conditions whereby they can utilise the minerals. This necessitates their obtaining a liberal supply of Vitamin D—the anti-rachitic factor that controls the assimilation of minerals and an absence of which will cause unthriftiness, paralysis, and rickets to develop, even though minerals be abundantly present. Sunlight is the most potent (and also the cheapest) supplier of this essential vitamin, and pigs running out in the open and exposed to it will, of course, receive all they require of it. If, however, they are confined to sties, these should be so constructed that they will let in plenty of sunlight. Greenfeed is also well supplied with Vitamin D and can advantageously be fed.

IMPORTANT WEEDS OF SOUTH AUSTRALIA.

[By G. H. CLARKE, B.Sc., Botanist at the Roseworthy Agricultural College.]

Nos. 17 and 18.—CAPE TULIPS.

(*Continued from page* 533.)

Differences Between the Two Species.—Examination of the open flowers of the two *Homerias* reveals marked differences in the structure of the style and its branches. In *Homeria collina* the slender style divides up into three flattened petaloid branches, which are quite free and from 5 to 8 mms. long, becoming broader towards their free ends. Along the upper surface of each branch runs a petaloid crest consisting of two lateral membranous flaps, one on either side of a central groove which terminates in a stigma. Towards the end of the branch these lateral flaps are prolonged forwards, the free portions forming a divided upper (or inner) lip with the stigmatic surface between it and the main part of the stylar branch which thus forms a lower (or outer) lip. In the young stages of the flower the stylar branches are folded together; but later on they open out and, becoming turgid, press outwards the upper parts of the respective anthers. The two lips of each branch, which were at first appressed and somewhat flaccid, now become widely opened, thus exposing the stigmas. When fully turgid the lower lip is curved outwards and may be partially wrapped round its contiguous anther; the upper lip is reflexed and appears as a pair of pointed, ear-like, flaps, projecting upwards and backwards.

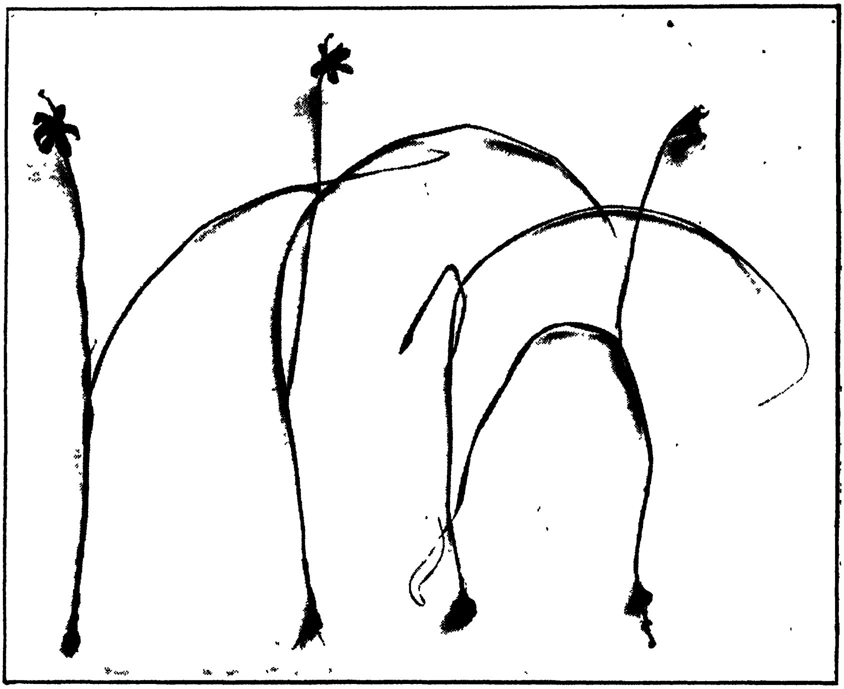
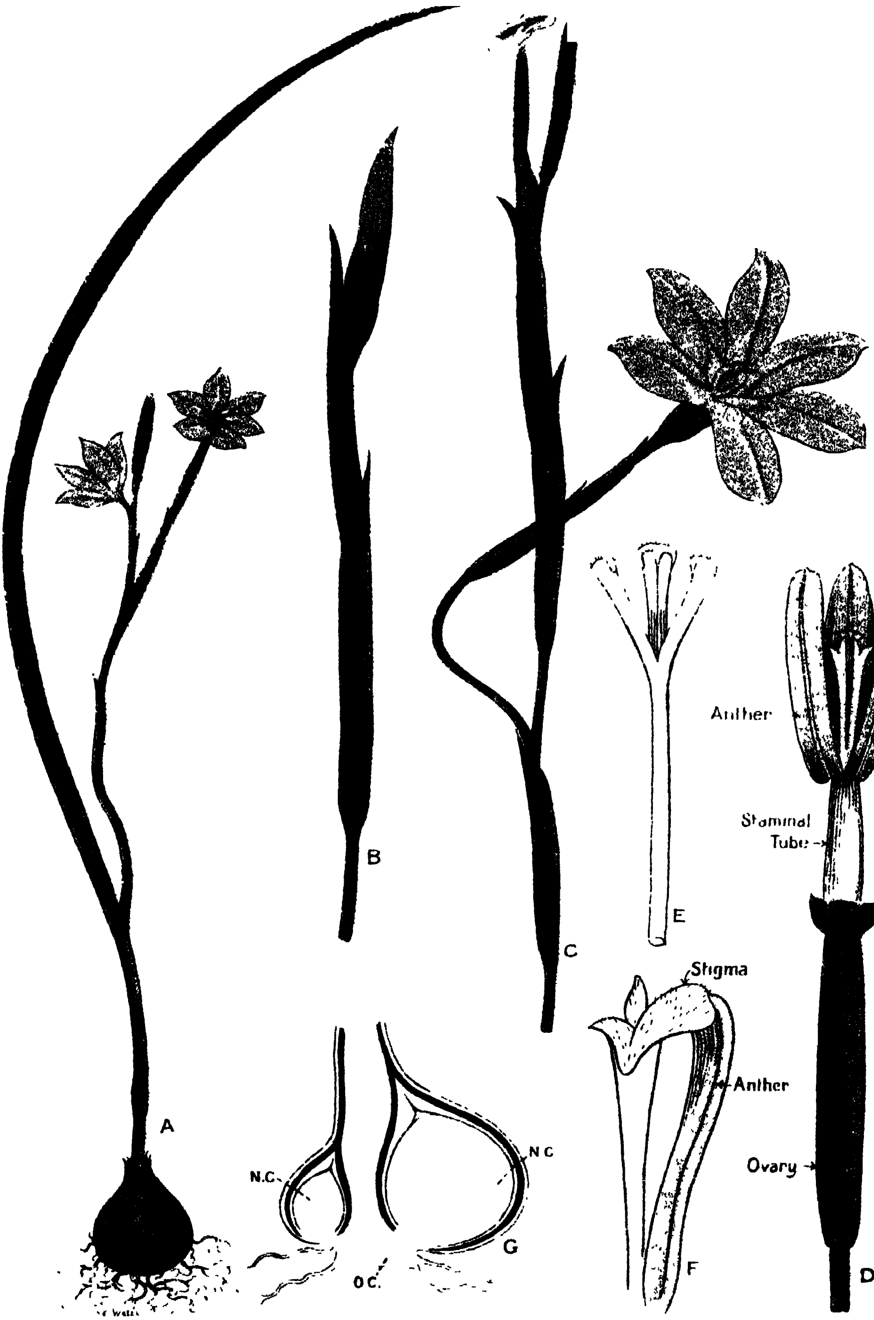


Fig. 1.—One-leaved Cape Tulip, *Homeria collina* var. *aurantiaca*. (See coloured plate opposite.)

In *Homeria miniata* the stylar branches are coherent except at their tips, the free parts being less than 1 mm. in length. The fused branches form a dilatation at the end of the style, shaped like an inverted pyramid, strongly compressed



ONE-LEAVED CAPE TULIP (*Homeria collina*, Vent., var. *aurantiaca* (Sweet) J. G. Baker). A.—Single plant in flower showing corm (x 1/3). B.—Portion of young flowering stem, showing flower bud emerging from spathe valves (Nat. Size). C.—Older branching stem showing open flower and developing fruits (Nat. Size). D.—Flower with perianth removed to show arrangement of stamens and pistil (x 3). E.—Style and its branches (x 4). F.—Single style branch viewed from the side in the fully expanded and turgid condition, showing the stigma and relationship to the neighbouring anther (x 10). G.—Base of plant in longitudinal section showing developing corms (n.c.) and remains of

laterally between the three projecting angles of the inverted base. These angles correspond in position with the intervals between the three anthers, so that, at first sight, the stylar branches appear to alternate with stamens. Closer examination, however, reveals that the points or angles, which are slightly notched, represent the lines of junction of the stylar branches which thus are represented by the sides, and not by the angles, of the inverted pyramid, and correspond in position with the anthers, as is usual in the family. When opened out each style branch presents a shallow notch and appears slightly bilobed, and this feature, taken in conjunction with the arrangement of the petaloid crests, is such that the stigma appears to be bordered by lateral, instead of by antero-posterior, lips. While the stigmatic surface is continuous with a groove as before, the lateral membranous flaps are not continued forwards as free portions, but diverge obliquely outwards and become continuous with the lateral margins of the branch. These differences will be apparent by comparing figure E of the coloured plate facing page 528 (November, 1935) with figures E and F of the coloured plate in this issue.

For purposes of clearness the more important differences between the two species of Cape Tulip are set forth in the following table:—

Homeria miniata.	*Homeria collina*, var. *aurantiaca.*
Produced leaves 2, together with a third shorter leaf supporting the inflorescence.	Produced leaf 1.
Nodes of stem swollen, due to presence of cormils in the leaf axils	Nodes not conspicuously swollen.
Corms formed below the ground; cormils formed both above and below ground	Corms only, formed below the ground.
Tunics of corms black and fenestrated	Tunics thicker, brown in colour.
Plants growing in dense clumps	Clumps smaller.
Stem not noticeably flexuose, often supported by third leaf	Stem weak and flexuose below the inflorescence.
Branches and flowers numerous	Branches and flowers few.
Flowers smaller; perianth segments less than 1in. in length	Flowers larger; perianth segments 1-1½in. in length.
Flowers mostly salmon-pink; base of perianth segments yellow, spotted with green.	Flowers varying from orange-scarlet to salmon-pink; perianth segments yellow at the base.
Staminal tube swollen and glandular-hairy at the base, longer than the anthers	Staminal tube uniform, glabrous, scarcely as long as the anthers.
Anthers less than 5mm. long	Anthers 7-10mm. long.
Style branches coherent	Style branches free.
Ovary less than ½ inch long	Ovary nearly 1 inch long.

Life History of Two-leaved Tulip.—The Cape Tulips are usually described as being perennial, and, from a practical viewpoint, they should be regarded as such, since new plants invariably appear at the sites of those of the previous season. In the strict sense, however, the perennial habit is by no means universal, nor is it necessarily the rule. Plants arising from corms, or from cormils, do not necessarily retain any organic connection with those from which such corms or cormils were produced. A fact of importance in this connection is that the production of a stem with flowers definitely terminates the life of an individual plant. Consequently, the time which elapses between the germination of a corm or cormil produced in the leaf axil of a parent and the flowering of the resulting Tulip measures the duration of life of the plant concerned. And from this point of view it is probable that the plants may be either perennial or biennial, or even annual, depending upon the size of the corms, the depth at which they are situated in the ground, and to some extent perhaps also on the seasonal conditions. The smaller the corm, the deeper its level in the soil, and the more unfavourable the conditions for germination and growth, the longer will be the period between germination of the corm and flowering of the resultant individual. Thus the cormils doubtless give rise to perennial or biennial plants, while those arising from medium sized and larger corms are probably most often biennial or annual in habit.

Apart from their size, the corms and cormils are essentially similar structures. Each consists of a roughly globular axis or stem enclosed within one or two thicknesses of scale leaves, of which the outermost are very tough and serve as a hard protective covering, while the innermost contain starchy reserves and appear white in colour. The scale leaves are thickened towards the tip of the corm where they taper to a point, so that, viewed externally, the corm appears pointed. The axis or stem is composed of cells filled with reserve materials, and bears at its tip a small terminal bud, appearing as a minute greenish-yellow point, and consisting of a rudimentary stem surrounded by the primordia of leaves. The plant which subsequently develops is formed from this bud which grows at the expense of the reserves present in the main body of the corm. A second, more rudimentary bud is placed a short distance away (about 5 mm.) from the terminal bud, and appears as a small greenish-yellow spot. The function of this second bud is not clear, but it probably develops into a plant if the terminal one is injured. Thus the corm consists, in the first instance, of two internodes of swollen stem tissue enclosed within scale leaves.

When germination begins the substance of the corm, which is at first hard, becomes softer, and, if abundant moisture is present, it gradually assumes a more translucent appearance due to conversion of the starchy material into a colloidal or more soluble form. Meanwhile the terminal bud begins to grow and rootlets appear from near the base of the bud leaves. During the first year, and perhaps for a number of successive years, growth consists in the development, from below upwards, of a succession of leaves, the lowermost and outermost of which early become withered and frayed, forming membranous protective sheaths at the base of the single, much longer, green leaf, which appears above ground and constitutes the entire aerial growth during the first and subsequent preflowering seasons. Among a clump of Cape Tulips it is always possible to find growing amongst older flowering individuals a certain number of plants consisting each of a single very long linear grass-like leaf connected below ground with a corm, with the remains of the corm of the previous year attached to its base below the level of insertion of the slender rootlets. These young Tulips are liable to be confused with another South African plant of similar habit, namely, *Moraea xerospatha,* distinguishable from *Homeria* by its pale heliotrope flowers.

As the season advances a new corm is formed by enlargement of the internode immediately above the insertion of the single green leaf, the base of this leaf becoming expanded and fibrous to form the protective covering or tunic for the developing corm. Thus, during the preflowering seasons, new corms are formed by the successive enlargement of the internodes, from below upwards, of the original terminal bud, the apex of which remains dormant until the plant is ready to produce flowers. Such corms, one of which is formed each year, tend to become progressively larger and more deeply situated in the soil, especially in the case of plants originally developed from cormils. This brings about an apparent upward displacement of the tunics of the previous year corms.

The development of a flowering stem depends upon the growth upwards of the axis of the original bud and the lengthening of the internodes between its successive leaves. This is accompanied, in *Homeria miniata,* by the formation of axillary corms and cormils at each node. If a section be cut longitudinally through an entire plant in the plane which includes both leaves and stem, the latter will be seen to be continuous at the base with the shrunken remains of the previous year's corm, the persistent tunic of which remains as a protective covering, and may itself be surrounded in turn by the remains of previous tunics; there may, in fact, be a number of concentrically arranged tunics with numerous cormils between them, and representing the bases of former leaves of the existing plant, and outside these there may also be the semi-decayed remains of tunics belonging to the parent plant from which was derived the original corm that gave rise to the individual under examination.

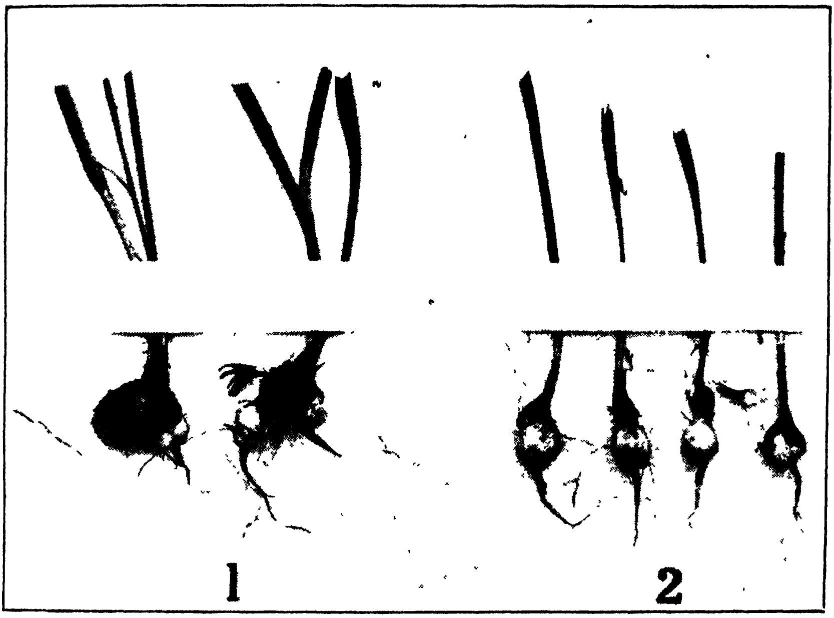


Fig. 2.—Two-leaved Tulip. 1. Base of young plants growing at site of plant of previous year. Note stout contractile roots, which draw down the corms to deeper levels in soil. 2. The same separated out. Note upward displacement of corm scales.

The two lowermost nodes of the stem, situated below the ground and immediately above the level of the old corm, bear corm scales or leaves in whose axils are developed lateral corms and cormils. These axillary structures are formed, in *H. miniata,* as parts of a branching system. There is a single large corm which is sessile in the axil and represents the terminal part of the axillary branch, and below this arises a dense cluster of cormils of various sizes connected by stalks of varying lengths to a short branching axis. The two oppositely placed systems of corms and cormils are equally developed and cause two pronounced bulgings, one on either side of the base of the stem. They are enclosed by the subtending corm scales which extend upwards, above the ground level, as protective sheaths to the lower part of the stem.

The internodes above the insertion of these subtending scales are greatly elongated, the next nodes being all above the ground. The lowest two nodes above ground level give attachment to the produced leaves which may be from 1½ft. to 2ft. in length. These leaves are V-shaped in cross-section at the base, and are termed *equitant* (literally "astride"), the stem being clasped by the two arms of the V. The nodes at which these leaves arise are swollen due to the presence of cormils in their axils. In addition to the two long leaves there is usually a third, much shorter, leaf, similar in structure to the first two.

The remainder of the stem consists of the branched inflorescence. The branching occurs in a curiously zigzag manner. Each node is protected by a short leaf, or bract, in whose axil arises a number of minor inflorescences on peduncles of varying lengths in addition to occasional branches similar to the first. Each minor inflorescence consists of a small cluster of flowers enclosed within spathe leaves from which they emerge and open successively. The flowers open widely in sunlight, but tend to remain closed in shade or during dull weather. The perianth of the flower is extremely delicate and withers early, becoming twisted around the stamens and style surmounting the ovary, which enlarges somewhat to form a club-shaped fruit or capsule.

When the flowering stem dies down, the corms and cormils formed in the axils of leaves and corm scales lose all connection with the plant and remain dormant in the ground until the following year when each one is ready to produce a new individual. This means that a cluster of new plants will appear at the site previously occupied by the parent. Several hundred cormils may be formed by a single individual. By repeating the same method of cormil formation dense patches of the Tulip are produced, and, if one of these patches is uprooted, many hundreds of corms and cormils will be found clustered together in a dense, almost spherical clump (See Figure 3).

The enlargement of a clump and the separation of its constituent individuals are assisted by the descent of the corms into the ground. During germination one of the roots becomes thickened and contractile, drawing down the corm, away from the old tunic and subtending scale, into a deeper part of the soil. Thus Cape Tulip, like the Soursob (*Oxalis cernua*) possesses contractile roots, but the mechanism of contraction is, in this case, quite different from that seen in *Oxalis.*

Life History of One-leaved Tulip.—In *Homeria collina* the general course of the life history is similar to what obtains in the case of *H. miniata*, but the end results are somewhat different, owing, chiefly, to the smaller number of corms produced per plant. As before, the individuals doubtless comprise perennial, biennial, and annual forms. A longitudinal section through the base of a flowering plant shows that the lateral corms arise singly in the axils of the corm scales, and that, of the two formed at the base of the stem, one is considerably larger than the other, so that one side only of the base of the plant shows a conspicuous bulging, the other side appearing somewhat flattened due to contact with another corm belonging to a sister plant, and representing the smaller of two sister corms belonging to the earlier generation, the larger one having given rise to the plant under consideration. In other words, of the two axillary corms present at the base of this plant (see figure G of coloured plate) the larger one will grow, during the next season, into a flowering plant similar to the one figured, whereas the smaller one will produce an individual which will not flower until the following year. Thus the absence of cormils, and the unequal development of corms at the base are the main differences between the two Tulips as regards vegetative multiplication. Another point of difference is seen in the tunics which, in *H. collina,* are thicker and browner in colour than those of *H. miniata.*

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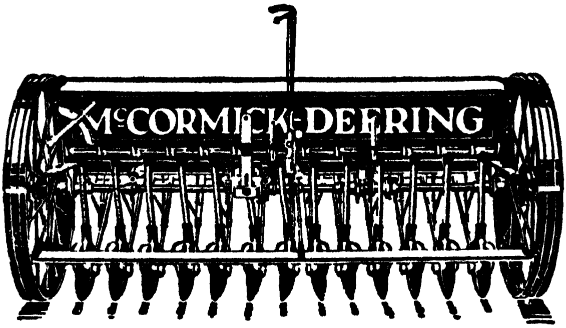

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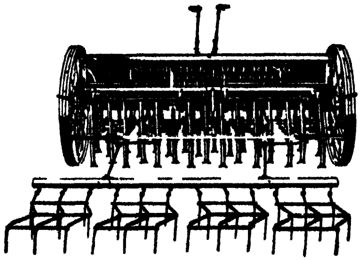

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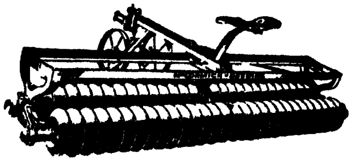

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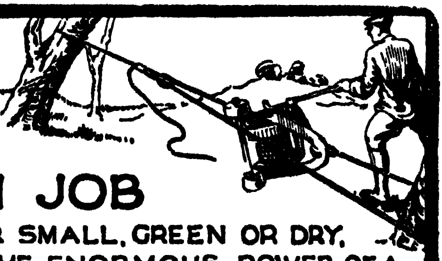

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When the returns from the whole seventeen centres were averaged the following results were secured:—

No manure—18bush. 59lbs. of wheat per acre.
1cwt. of carbonate of lime—18bush. 33lbs. of wheat per acre
1cwt. of superphosphate—23bush. 28lbs. of wheat per acre.
1cwt. of superphosphate, 1cwt. carbonate of lime—22bush. 25lbs. of wheat per acre.

NO ADVANTAGE GAINED FROM CARBONATE OF LIME.

From these figures it will be seen that the returns from the "no manure" and "1cwt. of carbonate of lime" plots were practically equal, indicating that no advantage was gained by the use of the latter.

A similar condition of affairs exists when the yield from the superphosphate plots is compared with that from the area receiving both superphosphate and carbonate of lime.

On the other hand, if the return from plots receiving 1cwt. of superphosphate is compared with that from those receiving an equal weight of carbonate of lime, it will be noted that there is a very marked advantage in favour of the former; in fact, practically 4½bush. of wheat to the acre.

Reviewing the results, therefore, an application of lime has not brought about an increase in yield over and above that from the "no manure" plot. Further, a combined dressing of superphosphate and lime has not given a greater quantity of wheat than the plot receiving superphosphate only. Consequently, no recommendation in favour of this material is possible.

It is true that the foregoing returns are the result of a single season's work, but it is most unlikely that weather conditions would affect the comparative yields to any extent. It is considered that, within limits, no matter what type of season was experienced, the influence would be the same on both the limed and unlimed plots. Consequently, as the experiment was fully replicated and conducted under a variety of soil conditions, it may be accepted that the results obtained are conclusive so far as the fertilising effect of carbonate of lime applied to wheat crops in this State is concerned.

It is, therefore, definitely stated that carbonate of lime must, on the average, cause distinct financial loss if used as a manure for cereal crops.

Reference has already been made to the fact that lime occupied a definite place in improving the physical properties of soils. However, generally speaking, the wheat-growing lands of South Australia are well supplied with this material. As a rule, the greatest loss of lime occurs where there is high annual rainfall and free drainage, with the result that, except for a relatively small area of red boggy land in the Lower North, the greatest need for lime in this State occurs in the sour soils of the Adelaide Hills and South-East. In such circumstances, dressings of at least half and preferably 1 ton to the acre are necessary, and these should be added to the land about once in every ten years.

For suburban gardeners, who are troubled by the heavy nature of the land with which they have to deal, an application of about 1lb. of lime to the square yard is recommended.

In this connection, as ground shell consists of hard water-worn fragments of calcium carbonate, which are not readily dissolved by soil moisture, other forms of agricultural lime of a more soluble nature are to be preferred.

In conclusion, therefore, whilst lime has a certain value for improving soil conditions, the experiments show that it is not required as a fertiliser for cereal crops in South Australia.

In the following table the experiments from which the results quoted were obtained are shown.

Experimenter.	No Manure.		1cwt. Carb. Lime.		1cwt. Super.		1cwt. Super., 1cwt. Carb. Lime.	
	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.
F. Cummings, Belalie North	13	2	13	10	18	24	18	7
A. J. Symonds, Bundaleer	19	1	19	53	20	42	21	14
W. A. Mills, Booleroo Centre	18	41	19	16	23	40	23	6
J. C. Kleinig, Laura	23	42	24	50	26	45	25	12
H. R. Lines, Laura	9	17	9	48	13	23	13	32
S. T. Arthur, Peroomba	23	24	22	1	27	—	26	33
Jettner Bros., Yandiah	13	15	12	20	15	45	14	55
W. H. Brown, Alma	20	28	20	39	29	10	28	31
Mugge Bros., Blyth	38	34	36	10	44	41	39	29
A. W. Roediger, Gawler River	17	55	19	18	25	7	23	15
E. Day, Reeves Plains	18	50	18	20	28	6	27	51
J. B. McDougall, Riverton	12	10	11	21	14	9	14	2
F. W. Coleman, Saddleworth	32	25	26	59	31	28	29	40
Molineux Bros., Tarlee	18	40	19	13	22	53	20	38
S. A. Bretag, Mannum	13	35	13	27	20	45	20	22
J. Wachtel & Sons, Palmer	18	40	19	4	23	—	—	—
Chas. Brook, Woodchester	11	2	9	43	13	53	12	6
Means	18	59	18	33	23	28	22	25

PAPERS READ AT CONFERENCES.

EYRE'S PENINSULA (CENTRAL), 18th October, 1935.

SOME ASPECTS IN THE BULK HANDLING OF WHEAT.

[C. JOHNS, Wudinna.]

In this paper it is intended to state briefly the more familiar advantages of Bulk Handling. They are as follows:—

1. The saving in cost of bags variously estimated at from 4 to 10 per cent. of present purchases, and the bags should last four seasons. There is considerable difference of opinion regarding this item, as must necessarily be the case when different methods of harvesting, cartage, distance, &c., are taken into consideration.
2. The wheat would be handled more quickly and cheaply.
3. Railway trucks would be handled more economically, less delay occurring in loading and emptying.
4. Losses which now occur in storage under the bag system, due to weevil, mice and climate, would be prevented.

ITS ADVANTAGES.

There are other advantages worth discussing more fully. For instance, it should be possible for the farmer to obtain a better price for his wheat by the adoption of grading, which would be possible with Bulk Handling. The f.a.q. system is not satisfactory, nevertheles it is the only system open to farmers so long as wheat is handled in bags. The f.a.q. system never gives the farmer the benefit of the doubt; the standard is always set low enough to be safe. It is distrusted by farmers. If a farmer's grain is below standard he may pass it through as f.a.q. because the merchant is also receiving wheat above the ruling standard. The farmer selling the better product gets no more, in fact, he is penalised for growing the best. During the 1933-34 harvest, wheat in many parts of Eyre's Peninsula was light. All buyers decided only to receive wheat on a 58lbs. basis, which resulted in every farmer in the district affected being docked 2d. a bushel, irrespective of the 60lbs. standard. As probably 50 per cent. of the wheat was up to standard, this was a glaring injustice, which was shared not only by the farmers, but by many agents. When the f.a.q. is set lower than it should be (and this is easily possible) it is also lower in England and there is resultant loss to the farmer and incidentally to the State. In England buyers are known to take little notice of the f.a.q. set by the different States in the way of differentiating between them, and invariably buy on the basis of the lowest f.a.q. Therefore, one State may be penalised for the misfortune of another.

There is no inducement whatever to grow a good sample and clean it as it should be cleaned. With Bulk Handling, many farmers would not recognise their own wheat as it poured out of the bags into the elevator, yet such an experience is necessary to many. The farmer cannot altogether be blamed for the chaff and dirt in the wheat as he knows he gets no more for cleaning it properly. How many farmers are satisfied with the merchants so-called "Free Storage"? There is no such thing as free storage; expenses incurred in storage are met by the farmer ultimately. The Verco Bros. case, fought out in the law courts, showed that once the wheat goes over the scales it is virtually sold. Free wheat in New South Wales—where Bulk Handling has been adopted—fetches 3½d. per bushel more than similar wheat in South Australia. Much of this extra 3½d. is attributable to the wheat being "free." A publicly owned Bulk Handling plant would ring the death knell of the famous "honourable understanding."

Consider the weighing of the bags; how many split pounds are received on a load of wheat? A weighbridge would not only be fairer, but quicker. Another point in favour of Bulk Handling is that appreciation in the weght of wheat—known to occur during storage—could, in a publicly owned plant, be put to offset construction costs. The farmer also rightly objects to maintaining so many country agencies, which are doubtless a charge against his wheat. The farmer is bound to store his wheat at some seasons, and so is relying on the mercy of the merchants. With a bulk storage unit at the siding or at a reasonable distance, independently operated, he would receive a certificate of weight, which could be made negotiable and so he could sell at will with unlimited competition from buyers in the city and elsewhere; he could also take advantage of millers' offers.

AND DISADVANTAGES.

First, there would be the expense to the farmer of converting his wagon or truck should he so decide. Rail trucks and ships would need alteration. This alteration regarding ships is now a somewhat out-of-date argument, as shippers prefer Bulk Handling, and in New South Wales bulk wheat costs 2s. 6d. per ton less for freight than bagged wheat, and shippers have stated that they will make a reduction of 5s. per ton when all Australian wheat is handled in bulk. The two most weighty arguments against Bulk Handling is first the displacement of labour. Machine handling of products —perhaps the greatest cause of unemployment to-day—seems inevitable, yet it must not be forgotten that the large amount of money now going to India for cornsacks would, if saved by the farmer, be spent on his farm, and thus give more employment.

The second sound argument is that South Australia is geographically unsuited to Buly Handling, having nine deep seaports and some 35 to 40 small ports. Besides the above, there is the hostility of the merchants who, under the present system, can easily obtain a monopoly of the supplies and so manipulate prices. The same thing would also happen with Bulk Handling were all buyers allowed to construct and own their own Bulk Handling plants at stations and sidings. In Canada and America, where this was allowed, it resulted in much confusion and necessitated considerable legislation to protect the farmer. However, this is not likely to be allowed here, because of State-owned railways and harbours. In New South Wales the Bulk Handling plant was installed by the Government at very great expense and came in for much criticism when constructed, yet, in spite of the handicap of high capital costs, farmers benefit to the extent of 2¾d. a bushel. A charge of 2d. a bushel is made for the handling, which includes interest on the cost of installation.

THE WESTERN AUSTRALIAN SCHEME.

In Western Australia a scheme of Bulk Handling of wheat is operated by a limited company, The Co-operative Bulk Handling Co., Ltd. This concern operates at 53 sidings and took over the sites, sheds, plant, &c., of Westralian Farmers Ltd. and the Wheat Pool of that State. Bulk Handling Ltd. is run by those two concerns and two others. They enjoy something in the nature of a monopoly, and for this reason had to fight hard to obtain the necessary concessions from Western Australian railways. The agreement entered into between Bulk Handling Ltd. and the growers who use their facilities is as follows: The company is to make a reasonable charge for handling and will arrange with growers to advance to the company amounts per bushel called "tolls" to be used by the company to recoup them for original outlay and the repayment of purchase-money, advances and interest. The farmers eventually shall become the sole owners. They will pay a toll of ¾d. per bushel on wheat delivered until such time as the costs are paid. The whole capital cost of the system was less than £150,000. Handling costs amount to 1½d. per bushel, and the net saving to the grower is 2½d. per bushel compared with 2¾d. in New South Wales. A Royal Commission, inquiring into Bulk Handling in Western Australia, in its report recommended that Bulk Handling Ltd. be allowed to complete its proposal for a State-wide scheme and the provision of up-to-date orthodox concrete terminal silos at Fremantle and Geraldton, controlled by the Harbours Trust and railways respectively. The Commission also considered that legislation should be enacted for the protection of those vitally interested in

Bulk Handling, which suggests that the farmer under the scheme now operating is not sufficiently protected against losses which might occur. Both of these two methods —that of New South Wales (State-owned) and that of Western Australia (co-operatively-owned)—have much to recommend them. The State-owned does not necessitate the farmers having to raise the large sum of money required to commence operations, and they should have a means of appeal against hardships, losses and any other injustices which might occur in starting operations. Such an appeal would perhaps not be available if the concern was owned privately.

The latest inquiry into Bulk Handling in South Australia was that of the Public Works Standing Committee, who issued its first report in 1933. Evidence taken in New South Wales and Western Australia strongly favoured Bulk Handling. The scheme advocated by the above Committee was that an experimental unorthodox system be started at Wallaroo with a later extension to Port Adelaide. A cost of 3d. per bushel on export wheat and 2½d. on local consumption wheat was stated to be necessary to meet handling costs; the farmers using Wallaroo and Port Adelaide facilities were expected to benefit to the extent of £146,000, and the Government would profit to the extent of £17,600 in a normal season. The Public Works Committee suggests that the scheme be controlled by a Board of Management of one representative each of the following:—Government, Harbors, railways, merchants and farmers.

These three schemes are much in the limelight at present, and it is likely that at last something may be accomplished. If all farmers seriously consider the possibilities of Bulk Handling they will come to the conclusionthat it is a means of substantially reducing costs of production and an economy which cannot much longer be denied. A few pence gained per bushel on our wheat means, not only a great saving to the farmer, but to the State also. Can we afford to overlook up-to-date methods when economy in every direction is so urgent and competition so keen?

MANAGEMENT OF THE FARM FLOCK.

[Max O'Brien, Kyancutta.]

Owing to the high cost of production and the low price obtained for wheat during the last few years, many hard working men have left their holdings in the Mallee areas. This action is very detrimental to South Australia, for it not only means that there is another man joining the ranks of the unemployed, but in most cases it means that there is another partly developed farm going out of production. Though it may be said that the State is producing more wheat at the present time than can be sold at a profitable price, the fact remains that by such lands going out of production a further burden is placed upon the man who is still willing to carry on and try to pay his way under present conditions.

Therefore, an effort must be made to suggest some way to enable every mallee farmer to obtain a living from his holding, and there is no better way at present than by turning his attention to sidelines. Owing to distance from markets it is impossible to make more than a small profit from pigs, butter or eggs. These lines, of course, will bring in a few shillings per week to the average farmer, which in these days is a great help, but they will not help him to pay rates, taxes and working expenses on his farm. To meet these commitments there is no better way than the raising of stock and the production of wool.

Sheep and Wool.

It is not meant that the farmer should give up wheat growing and depend on sheep for a living, but that he should combine the two and get the maximum return from his holding.

The first point to consider is whether the farmer is to produce export lambs or rely entirely upon wool for his returns.

If for wool alone, a good type of plain-bodied Merino ewe should be selected and mated with a robust, large-framed Merino ram. The selection of the ram is all important. He must be free, so far as possible, from wrinkles, and show masculine quality with a good, dense fleece of strong wool. A broad forehead with horns set well apart is another essential feature. Much useful information can be obtained by members attending agricultural shows and getting the judges to outline the good and bad points of the exhibits after the awards have been made. Should the farmer consider the production of lambs for export, he would be wise to obtain big, roomy Merino ewes, which have been previously mated with Merino rams, and cross them with an English ram—one of the British breeds suitable to his district. I would suggest the Dorset Horn ram as a sire for mating with Merino ewes, the result being a well-formed, quick-maturing lamb. The Merino ewe gives a greater return from wool than any crossbred ewe, although the crossbred ewe produces a slightly better lamb for export than the Merino, chiefly because she is a better mother. If using a Dorset Horn ram, be careful to select ewes which have had a lamb, as many young ewes are lost through being mated with these rams.

The next item to decide is the number of sheep that can be carried safely. Do not risk overstocking, as this may ultimately defeat the original purpose. It is not only the number of sheep lost through overstocking that counts, but the number of lambs as well. Again, overstocking is likely to cause drift, which causes sand and dust in the wool, thereby reducing its value. A sheep in poor condition will not give the same return as one which has been in good order the whole of the year.

In order to avoid the possibility of losing sheep and at the same time obtain the maximum return by carrying as many sheep as possible, provide a reserve by planting cereals for feed, the planting of suitable grasses such as Wimmera Rye Grass and Lucerne, or by top dressing present pastures.

Sheep are also a great asset in keeping fallows free from weeds and returning a big percentage of manure to the ground, but they should not be used excessively as scavengers as it is most detrimental to the wool.

SHOULD THE SYSTEM OF FARMING, AS PRACTISED IN THIS DISTRICT, BE REVISED?

[E. H. Edmonds, Pygery.]

The cultivation of the soil for the production of food supplies for mankind, can be traced back to the dawn of history. Bounteous Nature supplied the wants of primitive man, in the form of seeds, roots, herbs, &c., but it is believed that even in those distant ages the discovery was made that cultivation and tillage of the soil improved both the quantity and quality of its products.

The early Egyptians are credited with having introduced agriculture on a large scale. Even before foreign conquerors had entered that land, methods of agriculture had been evolved to suit the peculiar conditions of the Nile Valley, and so it has continued, ever changing conditions have called for altered and advancing ideas.

As man set out on his mission to "replenish the earth and subdue it" the changing of economic conditions, again gave rise to an alteration in agricultural practices. He became, not only a grower of his own requirements, but also the requirements of those engaged in other pursuits, and systems of barter and exchange were introduced.

The discoverers of Australia, indeed, even our pioneering forefathers, found a primitive man inhabiting this vast Continent, who depended entirely upon Nature to supply his daily bread and means of subsistence, but the white settlers' needs were greater, and in consequence, old world methods were introduced for assisting Nature to supply the demand. It was not long before the newcomers discovered that this country presented agricultural problems peculiar to itself and with which they were unfamiliar, but as development extended such problems were met and dealt with.

With a steady increase in the country's population, agricultural and pastoral activities were extended further out beyond the main centres of settlement, and as such extension took place, so the problems incidental to changing climatic and soil conditions increased. It was soon realised that rainfall became less as advance was made inland away from the coastal areas. This was met by the introduction of a system of fallowing, and by keeping the surface soils loose and friable, thus aiding the conservation of moisture taken into the ground during the fallow period and having it available for the subsequent sown crop. It was found also that disease attacked the crops, especially wheat, but certain varieties were discovered and established that were resistant or immune to such diseases. Further, varieties of cereals were introduced having a shorter growing period and which more quickly reached maturity. Later on it was found that the scrub or mallee lands were capable of being converted into good farming areas, and implements were devised and invented for dealing with this particular class of country, and thus development went on until the present time.

Throughout the years covering the history of agricultural development, problems have arisen that must be solved, and difficulties crop up which must be overcome, and it is safe to say that history will go on in repetition of this state of affairs, and it is our job as men engaged in the business to play our part in meeting the position as we find it.

THE SETTLEMENT OF THE DISTRICT.

In common with all mallee areas the first job was to clear the scrub. Sheep and other stock had to be carried, both as a source of revenue and for assisting in building up the fertility of the soil. Fencing, water supplies, and the many other improvements and facilities had to be provided, and as these were established, farmers settled down to a more or less orthodox system of agriculture, in which bare fallowing—and at least some introduction of rotation of cropping—played an important part. However, it must be admitted that the continued recurrence of problems is just as much in evidence to-day as in the past, and it is this fact that gives rise to a consideration of the matter as outlined in the title of this paper.

It is quite safe to say that the ultimate aim of farming methods is to procure a maximum return for a minimum outlay. Farming is a business, and because certain practices have been followed over long periods of years, and have become to be recognised as something in the nature of a standard, there is no reason why some departure from established usages and customs should not be attempted, if such change is considered advisable to meet altered conditions.

As followers of agricultural pursuits, residents of this district have suffered—in common with those engaged in the industry elsewhere—on account of the unsatisfactory economic conditions that have prevailed for a number of years. In addition, farmers in this part of the State have to contend with a comparatively low rainfall and land of light texture.

The orthodox system of recognised good farming methods includes a rotation of bare fallowing, but farmers in this district must very seriously consider whether this practice can be longer followed, and whether some other method will be necessary, giving a better economic result.

FALLOWING.

Its Advantages.

1. The advantages of bare fallowing.
2. The disadvantages of same.
3. A suggested alternative and its relation to 1 and 2.

The term or word "fallow" means "untilled" or "ploughed and left unsown." This practice was carried out long before this Continent was discovered or at least inhabited by white people, but it appears that this method was used by the ancient farmer as a means of resting his land and allowing it to recuperate by the absorption of fresh supplies of plant food gathered from the air and rendered available through chemical action, following the entry of light and aeration of the frequently worked upper layers of the soil.

The Australian farmer of to-day recognises thc beneficial results following the practice of bare fallowing, but undoubtedly it is the claim for a better conservation of moisture that provides the greatest incentive for its general practice, particularly in areas of lower rainfall.

From a purely district standpoint, it can be added as advantages of bare fallowing, that the heavier work of ploughing and picking off stumps and stones is more conveniently done during the fallowing season. The land is then in a well worked state and can be seeded in less time and fuller advantage can be taken of favourable seasonal conditions. Weed growth—if kept under control on the fallows during spring and summer—is more easily dealt with and cleaner crops are the result. Bare fallow is also an undoubted preventive. Takeall and "Haydie," due principally to the fact that all growth of grasses, &c., that are susceptible to attack are eradicated.

Crops cleaner and truer to type can be grown on fallowed land owing to the absence of self-sown growth, and in many other directions this old established practice has other advantages that are known and appreciated by farmers generally.

THE DISADVANTAGES.

The first, and by far the greatest of these, is the tendency of the light-textured soils—such as are found in this district—to blow and drift.

After 20 years residence in the district it must be admitted that as the scrub is cleared out the natural wind-break is removed, and in consequence strong winds have full play over the cultivated areas, with the result that the loose surface soils are blown away together with vegetable matter and humus that have taken years to put there. Every farmer in this district has had the experience of going on to a paddock of bare fallow at seeding time and finding acres of it hard and bare and the loose top soils piled up along the fences, or on adjacent roadsides.

Some farmers contend that the drifting of the sandridges out to the intervening flats tends to improve the quality of the latter, and the writer has to admit at one time subscribing to this opinion, but this has disadvantages, inasmuch as the ridges become blown out into uneven holes and hillocks, right down to the underlying clay and limestone, and thus become of poor quality from a cereal growing point of view; much of the land hereabouts consists of "sand ridges" as distinct from "sand hills," and by the provision of humus from animal droppings and the growth of suitable clovers, &c.; these can and are being built up into quite good soils. It seems to be definitely uneconomic to make it possible for this to be blown away in the matter of a few days of rough windy weather.

A further disadvantage is the loss of feed from the area fallowed for at least half the year. Where sheep are kept these are run on the area for the purpose of keeping down any weed growth that appears, and the travelling of such stock over the ploughed ground acts as a cultivation and tends to keep the surface soils loose and friable. Farm wool is notoriously dirty for this very reason, and therefore sheep running on fallows never produce a clean fleece. A difference of at least 2d. per pound will result between dirty and clean wool of the same relative quality, and in the average farm flock this may mean anything up to, say, £40 per annum that will need to be offset by an increased yield of the resulting crop grown on fallowed land.

Having briefly examined the pros and cons of our present system, let us pass on to a consideration of the possibilities of achieving our object of procuring a maximum return for a minimum outlay, by some other methods more suitable to our time and needs and the physical peculiarities of this class of country.

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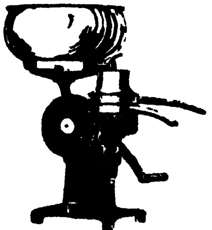

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[*Papers Read at Conferences.*]

THE ALTERNATIVE.

Sheep and Wool.

Ninety-nine per cent. of farmers will declare that to produce a satisfactory return from wheat, crops must be sown on fallow, and there is ample evidence available to support this contention, but the point for consideration is, can similar objects be obtained by other means, without the disadvantages that have been enumerated? By similar results, is meant the ultimate monetary return from the farmer's outlay in capital, time, and labour.

In recent years farmers to some extent have ceased to "place all their eggs in one basket" by depending entirely on wheat growing. The keeping of sheep for wool, the raising of lambs for export, production of pigs, and in some cases dairying, have given more or less revenue from sidelines, but we can, with advantage, increase the number of stock and give attention to the growing of other cereals, and make them a source of revenue production to an extent that will leave us free to regard the matter of wheat growing of lesser importance than it is to-day.

Despite the somewhat chaotic economic conditions prevailing in the world and their influence on the question of the disposal of primary products, it appears that wool is a commodity that at all times commands a fair average price. Australia is one of the greatest producers, and further, produces a class of wool required for almost universal needs.

WATER AND FODDER SUPPLIES.

The first requirements for a flock of sheep are an abundance of water and feed. In this district, the former is provided by the Tod River scheme, and as there does not appear any likelihood of the mains being extended to an extent threatening the present supply, this can be taken as being assured.

The question of food, however, is of real importance and requires careful planning and forethought. Two hundred sheep in good condition with an abundance of feed are of more value than 400 half starved, bony wrecks, so that if flocks are to be increased steps must be taken to provide adequate food supplies, not only for immediate use, but against those lean periods that experience has taught us periodically occur. The natural grasses and weed growths that follow cropping will not do this, and the conservation of fodder crops for this purpose becomes necessary.

Having regard first to the somewhat doubtful rainfall, and second, to the growing of that class of crop that is going to assist in building up the soil fertility, oats are placed first as being most suitable. In an average year oats will stand grazing for a while during the growing period, can later be reaped for grain and stored as a reserve to be hand-fed during autumn and early winter, should natural paddock feed be scarce at the seasons mentioned. Provided some care is taken at harvest time and the oat heaps are made long and narrow and well covered with straw, there is no need for these to be winnowed. In due time, the heaps can be fed to sheep as required, chaff and all, in feeders or distributed in the paddocks on the ground. By this means, the cost of cleaning and bags can be saved, and the loss owing to the ravages of mice—which usually takes place where oats are stacked in bags—is eliminated.

Barley grows well in these districts, in an average season, and whilst the writer has no personal knowledge of its use as a sheep feed when fed as grain, it provides a good early green fodder crop and the corn is good food for pigs. In addition, the malting varieties should be grown for sale, taking the place of wheat and worked in a system of crop rotation.

There is no reason why profitable crops of this cereal should not be grown here, at least in seasons of average rainfall.

South Australian malting barley has a good reputation, not only in the home market but abroad, and much of this State's output is produced on Yorke Peninsula and from country very similar to this district.

PIGS AND COWS.

The breeding of pigs for supplying the export and home markets also presents a source of revenue. Fodders and corn can be grown that, marketed through livestock, will give a better return per acre from the area utilised, than will be yielded by the average wheat crop at present prices.

For those conveniently situated to a siding, the return from cows can be made quite satisfactory, but here again ample provision must be made for fodder supplies. Dairy cows require good succulent food, and whilst this is available during winter and spring by natural grasses or planted crops, it is best provided during summer in the form of ensilage. The writer has no personal experience of the preparation or use of this class of fodder, but from information available, and the fact that those people engaged in the industry conserve supplies and grow crops especially for this purpose, its beneficial results are undoubtedly established.

There is now upon the market a grade of artificial fertiliser for which the makers claim special advantages where it is used in the production of crops off stubble and grass lands. This appears to be one of those instances of which mention was made earlier where steps are being taken to meet altered conditions, and this should be given a trial as a means of working a rotation of cropping combined with other farming activities, that will permit of the elimination of bare fallowing, but still achieve the same or even better economical result.

The application of heavier dressings of superphosphate and the application of other forms of artificial manure tends to the establishment of other and better classes of fodder crops and grasses, such as clovers, and these in turn increase the carrying capacity of the land and at the same time enrich the soil.

As a suggested rotation, cutting out bare fallowing, it should be possible to work the following, viz.:—Wheat, oats, barley, oats, grazing, wheat. As barley and wheat are both subject to Takeall, it would appear to be advisable to break these two with a crop of oats, and by having oats following barley and then grazing, there would be little danger of barley appearing in the wheat crop to follow.

The barley crops can either be malting or feed lines. The former should find a market at a satisfactory price, whilst the latter can be fed to stock. The harvesting of Malting Barley requires more care and attention than is necessary for other cereals, but information on this point is readily available, and no doubt farmers could and would soon become conversant with the points mentioned.

To summarise:—

Revise the system of farming in this district by the elimination of "bare fallowing."

Increase the carrying capacity of the land by:—

(1) The planting and establishing of better classes of grasses and fodders.

(2) Growing cereals for feeding to stock, particularly oats for sheep and barley for pigs.

(3) Reduce the area under wheat and increase the number of sheep and other livestock carried on the farm.

TREATMENT OF FALLOW.

[O. J. MURPHY, Warramboo.]

Statistics show that the wheat yield in South Australia on fallowed land is considerably higher than the yield of non-fallowed land. It is to be regretted that so far as Eyre's Peninsula is concerned, a comparatively small percentage of the crop is sown on bare fallow. If the Eyre's Peninsula farmer had sufficient confidence in the practice of fallow to give to it the same amount of earnest endeavour as he gives to seeding and harvesting operations, the improvement in the general average wheat yield would be outstanding.

The main objects of fallowing should be the conservation of moisture, the destruction of weeds and the formation of a solid seedbed. The seedbed in which the wheat plant thrives best is a well compacted soil overlaid by a shallow layer of fine loose soil.

In the upper part of Eyre's Peninsula, farmers have to deal with sandy and light loamy soils over porous limestone subsoils—in which the mallee stumps have yet to be totally destroyed. Obviously the formation of a solid seedbed is a difficult problem. Moreover, it is necessary to contend with weather conditions which are frequently very severe in spring. The failure to appreciate the importance and the difficulty in obtaining the kind of seedbed the wheat plant requires, is probably the chief reason why fallowing is not more widely practised, and also the reason why fallowing has so frequently led to disappointing results. The neglect of taking at least some measures to guard against adverse weather conditions in spring may also be a contributing factor towards disappointing crop returns.

Rain is an important agent in the forming of a compact seedbed, and where the rainfall is light, fallowing should be done early—immediately after seeding. A stroke of the harrows soon after the first working of the soil is of great advantage, particularly if the soil is well grassed. This operation appears to be of more importance than the cultivation of the land in spring. Spring months are often marked by dust, periods of dry weather, high temperatures and hot winds; conditions which are not suitable in working up soils liable to drift. Spring cultivation should be done if possible when the surface of the soil is damp.

The management of fallow in the late summer, and autumn and seeding periods often determines the success or failure of the crop, irrespective of the character of previous workings. Deep working of the fallow during these latter periods should be avoided. Use harrows in preference to the cultivator, and disc drill in preference to the combine wherever soil conditions permit. Harrows will destroy 90 per cent. or more of the weeds if used immediately after germination, and if loose stumps, roots, and other obstacles are first removed, harrows with share points attached will ensure a first class job. A 100 per cent. job cannot be expected while there are stumps in the soil to lift the cultivating implement when the wheels pass over them. The point to be emphasised, however, is that though shallow cultivation may not destroy so many weeds, the weeds not destroyed will not affect adversely the crop yield to the same extent as deep cultivation, resulting in the loosening of the seedbed. In the writer's experience, the use of a cultivator at seeding time to destroy Mustard plants resulted in a decrease of at least 30 per cent. in the wheat yield as against the use of drill and harrows on fallow in the same paddock.

In regard to spring fallow, it is doubtful whether spring fallow pays under local conditions. In years of low rainfall and scarcity of early winter feed, farmers are tempted to postpone fallowing operations until spring, when the feed will have reached its fullest growth.

As the use of rollers or cultipackers is impracticable on light, stumpy ground, it is impossible to obtain a good seedbed after turning in feed in spring. Better crop results will probably be obtained by burning off the grass in February and then cultivating the soil in preparation for seeding. A course of action likely to give good results is as follows:—Before fallowing immediately after seeding—and if the soil is light—use the rigid tine cultivator in preference to a disc or mouldboard plough, in order to leave rubbish on the surface. Complete the initial working by the end of July. Harrow the soil as it is ploughed. This will mean an average of one day's harrowing per week. Use the cultivator with wide shares, working at a shallow depth in spring, preferably when the surface is damp. In late summer and autumn, have the harrows ready for use after rains which may germinate weeds. If conditions have been favourable for the early germination and destruction of weeds, use a drill and harrows in preference to a combine, and sow during May. If no early rain and germination of weeds have taken place, sow in May just the same, and use the harrows three or four days after the first good rain has fallen. Crops sown on fallow during May in an average season will not be damaged by frost, and will also be sufficiently far advanced to withstand adverse weather conditions in spring.

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during .Nov.	Per Cow during Nov.	Per Cow March to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow March to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	30	21·70	13,641½	454·72	3,943·34	695·94	23·20	200·82	5·10
9/C ..	16	16	11,400	712·50	4,902·18	488·12	30·51	208·44	4·28
9/D .	32·60	19·40	12,405½	380·54	3,745·82	651·37	19·98	205·80	5·25
9/E ..	14·23	9·10	9,101	639·56	3,979·27	466·70	32·80	198·44	5·13
9/F ..	18	14	9,675	537·50	4,502·86	437·86	24·33	200·81	4·53
9/G ..	31·60	26·60	26,235	830·22	4,807·26	1,332·16	42·16	245·49	5·08
9/I ..	29	29	21,600	744·83	4,489·42	986·18	34·01	193·24	4·57
9/J...	11	9·40	8,812	801·09	5,024·61	376·31	34·21	212·53	4·27
9/L ..	33	28·37	14,583	430·28	3,558·39	589·32	17·38	144·57	4·06
9/O ..	29·43	26·83	22,417	760·59	4,689·35	997·48	33·85	215·23	4·45
9/P ..	45	45	25,005	555·66	4,321·79	1,284·10	28·54	220·84	5·14
9/T ..	20	18·73	16,236	811·80	4,174·78	710·11	35·51	189·07	4·37
9/W .	28	15·10	13,334½	476·23	5,069·31	567·63	20·27	217·12	4·26
9/X .	10·23	9·90	6,442	629·71	4,092·60	342·09	33·44	207·92	5·31
9/Y ..	10	8·40	7,086	708·60	4,650·93	282·90	28·29	188·80	3·99
9/Z ..	14	11·83	5,955	425·35	3,056·50	338·82	24·20	156·43	5·69
9/Aa .	16·53	16·53	10,663	645·06	4,466·85	561·90	33·99	244·84	5·27
9/Bb .	29·97	28·93	15,437½	515·08	3,429·60	719·47	24·01	170·74	4·66
9/Cc .	17	16	9,435	555·00	4,756·68	514·10	30·24	253·70	5·45
9/Ee .	35·90	35·37	18,432	513·42	2,660·75	903·59	25·17	131·07	4·90
9/Ff .	4	3·80	1,707	426·75	2,261·55	70·61	17·65	84·40	4·14
9/Dd	17	14·30	7,953	467·82	2,416·82	349·67	20·57	114·25	4·40
Means	22·39	19·29	1,307·07	583·88	4,119·02	621·20	27·75	196·79	4·75

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow December to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow December to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	18·70	18·70	10,593	566·47	6,259·18	556·22	29·74	313·51	5·25
6/C ..	22·10	21·10	17,346	784·88	7,051·17	855·68	38·72	310·67	4·93
6/Y ..	14·73	10·73	10,874	738·16	4,721·74	435·53	29·58	194·65	4·00
6/Ff .	27·53	18·13	19,649	713·72	7,041·00	778·00	28·26	290·86	3·96
6/Kk	16·37	12·13	8,784	528·97	5,576·45	374·97	22·53	220·34	4·15
6/Ll .	24·83	15·70	13,649½	550·45	5,368·29	466·22	18·80	191·79	3·38
6/Oo .	20·83	18·70	19,844	952·66	7,714·04	798·70	38·34	323·96	4·02
6/Ss .	17	13·67	16,391½	964·20	9,222·45	569·24	33·48	348·93	3·47
6/Tt .	30·27	25·43	23,220½	767·11	7,829·37	974·14	32·18	327·60	4·19
6/Vv .	31·50	27·60	27,645	877·61	8,620·95	1,223·30	38·83	396·30	4·42
6/Xx.	26·93	20·10	18,865	700·67	7,356·48	754·28	28·01	297·02	4·00
6/Ccc	24	12	8,835	368·12	4,831·83	370·91	15·45	208·28	6·44
6/Ddd	24·03	18·57	19,511½	810·48	6,327·55	794·03	32·96	268·30	4·03
6/Jjj	24	18·73	15,111½	626·91	7,560·52	727·44	30·17	359·77	4·81
6/Mmm	9·87	8·87	6,119	619·96	8,022·35	267·11	27·06	362·41	4·36
6/Nnn	36 97	30·07	28,838	779,91	6,972·73	1,194·11	32·30	298·43	4·14
6/Ooo	32	27·43	27,619	860·18	5,542·90	1,135·32	35·36	228·26	4·11
6/Ppp	23·83	22·23	21,375½	895·98	5,427·97	819·00	34·34	213·65	3·83
6/Qqq	16	13·97	13,565	847·81	5,291·51	478·21	29·89	192·52	3·53
Means	23 24	18·62	17,254·26	742·56	7,255·90	714·34	30·74	305·89	4·14

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow July to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow July to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	9·10	7·03	4,427½	486·54	2,864·02	225·57	24·79	148·15	5·10
7/P ..	29·53	26·30	22,685½	768·26	3,352·33	1,015·12	34·37	156·24	4·48
7/Tt .	16·47	14·53	13,855	841·31	3,576·45	567·43	34·45	152·19	4·09
7/Bbb	78·37	61·77	49,154	627·20	2,769·67	2,215·15	28·27	123·69	4·51
7/Ddd	12	11·37	8,507	708·91	3,828·87	406·92	33·91	182·78	4 78
7/Eee	12	11	7,785	648·75	3,194·35	397·15	33·10	158·56	5·10
7/Ggg	17·33	16·03	10,892½	629·49	2,442·81	512·72	29·59	115·40	4·69
7/Hhh	14	14	14,295	1,021·05	3,032·74	464·63	33·19	98·91	3·25
7/Iii .	15·87	14·87	16,053	1,011·50	3,086·34	551·36	34·74	109·42	3·43
7/Kkk	25	24	21,435	857·40	3,473·93	1,010·29	40·41	165·02	4·71
7/Mmm	15·33	14·23	10,322	673·31	2,809·64	515·09	33·60	145·97	4·99
7/Nnn	18	17	14,843½	800 58	3,630·44	633·77	34·19	157·58	4·29
7/Ooo	23·37	18·73	13,801½	590·56	2,500·75	518·94	22 21	102·14	3·76
7/Ppp	18	18	11,321	629·00	3,008·34	554·82	30·83	143 89	4·91
7/Qqq	22	21·70	15,438	701·72	3,391·98	732·07	33·28	156·13	4·74
7/Rrr	22	18·10	13,954	634·27	2,798·99	599·19	27·24	123·64	4·29
7/Sss	8	7·70	6,845	855·62	3,719·34	238·13	29·77	146·00	3·48
7/Ttt	8·47	7·23	6,017	710·39	3,250·19	253·91	29·98	134·65	4·22
7/Uuu	21·80	21·80	14,529	666·46	2,354·75	646·01	29·63	101·08	4·45
7/Vvv	22	21·43	13,933	633·32	2,591·72	618·20	28·10	116·22	4·44
7/Www	18·53	15·07	12,521	675·71	1,339·29	514·43	27·76	55·62	4·11
7/Xxx	28·13	24·47	20,832	740·55	1,498·71	793·06	28·19	57·72	3·81
Means	20·70	18·47	14,702·11	710·40	3,109·62	635·63	30·71	137·69	4·32

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow October to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow October to Nov	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	36	36	27,240	756·66	1,609·16	1,464·06	40 67	86 30	5·37
5/D ..	31	30	17,580	567·10	1,261·37	1,010·30	32 59	69 91	5·75
5/E ..	38·03	33·27	21,718	571·07	1,234·36	1,171·56	30·81	65 49	5·40
5/R ..	70	60·67	31,763½	453·76	1,070·67	1,469·41	20·99	48·02	4·63
5/Z ..	39·83	36·53	28,273	709·84	1,478·54	1,531·21	38·44	80·72	5·42
5/Ee .	16·10	16·03	10,086	626·45	1,383 13	498·06	30·94	68·24	4·94
5/Xx	26	26	11,100	427·30	1,018·74	556·57	21 79	49 65	5 10
5/Yy	10·43	8·43	2,997	287·34	801·47	161·27	15 46	41 74	5·38
5/Aaa	19	18	9,810	516·31	1,307·96	495·60	26·09	64·98	5·05
5/Bbb	18	18	11,775	654·16	1,443·75	585·83	32·55	71 83	4·98
5/Eee	25·97	19·93	10,811	416·28	1,000·65	510·87	19·67	44·31	4·73
5/Hhh	14	14	9,810	700·71	1,371·89	404 00	28·86	57·13	4·12
5/Jjj	27	27	12,855	476·11	1,121·94	808·27	29·94	68·91	6·29
5/Aa .	21	19·80	12,693	604·42	1,329·88	555 69	26·46	57·17	4·38
5/Kkk	17	14·13	6,046	355·64	713·06	275·55	16 21	33·03	4·56
5/Lll	16	13·93	12,164	760·25	1,532·59	536·54	33·53	68·73	4·41
5/Rr	24·07	23·70	12,053	500·74	1,189·82	668·15	27·76	64 22	5·54
5/Mmm	32	29·60	23,455	732·97	1,505·40	1,117·47	34·92	71·13	4·76
5/Nnn	26	26	15,090	580·38	1,381·01	775·88	29 84	69·79	5·14
5/Ooo	28	16·83	15,047	654·22	1,506·13	688·73	29·94	66·29	4·58
5/Ppp	27·90	23·90	17,481	626·55	1,328·98	716·23	25·67	54·91	4·10
5/Qqq	30·70	29·30	16,342½	532·32	1,057·38	831·31	27·08	55·27	5·09
Means	26·77	24·59	15,281·36	570·75	1,257·89	765·57	28·59	62·32	5·00

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk. Per Herd during Dec.	Milk. Per Cow during Dec.	Butterfat. Per Herd during Dec.	Butterfat. Per Cow during Dec.	Average Test.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B	16	16	6,804½	425·28	336·37	21·02	4·94
6/C	21	18·94	13,413	638·71	631·29	30·06	4·71
6/Y	14·65	11·71	11,468	782·79	447·18	30·52	3·90
6/Ff	27·52	22·74	21,858	794·27	897·28	32·60	4·10
6/Kk	16	11	5,533½	345·84	252·85	15·80	4·57
6/Ll	24	17·19	14,270½	594·60	505·73	21·07	3·54
6/Oo	20·48	18·32	18,261½	891·67	797·74	38·95	4·37
6/Ss	16	13·87	15,707	981·69	568·39	35·52	3·62
6/Tt	28	25·26	22,880½	817·15	988·02	35·29	4·32
6/Vv	27	23·23	24,454	905·70	1,093·46	40·49	4·47
6/Xx	27·42	17·42	20,122	733·82	814·11	29·69	4·05
6/Ddd	23	20·10	17,465½	759·37	688·31	29·93	3·94
6/Mmm	9·13	7·42	5,470	599·11	236·55	25·91	4·32
6/Ooo	30·71	28·29	29,898½	973·58	1,259·60	41·02	4·21
6/Rrr	40	36·55	27,894	697·35	1,055·31	26·38	3·78
6/Sss	34	29·84	28,144	827·76	1,076·43	31·66	3·82
6/Ttt	25	20·45	15,726	629·04	696·35	27·85	4·43
6/Pp	14	13·87	9,826	701·85	495·92	35·42	5·05
6/Uuu	64·06	54·10	44,821½	699·68	1,924·90	30·05	4·29
6/Vvv	40	40	31,124	778·10	1,190·80	29·77	3·83
6/A	10	10	4,774	477·40	246·60	24·66	5·17
6/Ppp	23·81	21·74	22,609½	949·58	910·15	38·22	4·02
Means	25·08	21·73	1,875·11	747·63	777·88	31·01	4·15

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk. Per Herd during Dec.	Milk. Per Cow during Dec.	Milk. Per Cow July to Dec.	Butterfat. Per Herd during Dec.	Butterfat. Per Cow during Dec.	Butterfat. Per Cow July to Dec.	Average Test.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H	9	6·32	3,394	377·11	3,241·13	178·56	19·84	167·99	5·26
7/P	29	25·71	16,427½	566·47	3,918·80	724·32	24·98	181·22	4·41
7/Tt	17	16·52	12,745½	749·73	4,326·18	521·55	30·68	182·87	4·09
7/Bbb	79	64·68	46,420½	587·62	3,357·29	2,064·61	26·13	149·82	4·45
7/Ddd	12	10·68	8,329½	694·13	4,523·00	411·47	34·29	217·07	4·94
7/Eee	12	10·84	6,181½	515·13	3,709·48	295·15	24·60	183·16	4·78
7/Ggg	17	13·68	9,392	552·47	2,995·28	374·40	22·02	137·42	3·99
7/Hhh	14	14	12,214	872·43	3,905·17	393·04	28·07	126·98	3·22
7/Iii	15	14·06	12,085	805·67	3,892·01	380·45	25·36	134·78	3·15
7/Kkk	25	24·71	16,972½	678·90	4,152·83	800·87	32·03	197·05	4·72
7/Mmm	16	16	8,060	503·75	3,313·39	417·76	26·11	172·08	5·18
7/Nnn	18	15·48	11,525	640·28	4,270·72	470·59	26·14	183·72	4·08
7/Ooo	24	19·90	16,188½	674·69	3,175·44	631·69	26·32	128·46	3·89
7/Ppp	18	15·06	7,050½	391·69	3,400·03	349·94	19·44	163·33	4·96
7/Qqq	22	22	12,214	555·18	3,947·16	596·56	27·12	183·15	4·88
7/Rrr	22	18·97	10,944	497·45	3,296·44	474·26	21·56	145·20	4·33
7/Sss	8	7	5,053	631·63	4,350·97	179·60	22·45	168·45	3·55
7/Ttt	8·06	8	7,936	984·61	4,234·80	329·15	40·84	175·49	4·15
7/Uuu	23	23	12,611½	548·33	2,903·08	504·94	21·95	123·03	4·00
7/Vvv	20·26	19·58	11,397½	562·56	3,154·28	474·15	23·40	139·62	4·16
7/Www	18·58	16·77	11,436	615·50	1,954·79	476·49	25·65	81·27	4·17
7/Xxx	28·16	25·52	15,817	561·68	2,060·39	586·13	20·81	78·53	3·70
Means	20·68	18·56	1,247·25	602·99	3,710·96	528·89	25·57	163·06	4·24

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Dec.	Per Cow during Dec.	Per Cow October to Dec.	Per Herd during Dec.	Per Cow during Dec.	Per Cow October to Dec.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	36	35·90	25,633	712·03	2,321·19	1,363·77	37·88	124·24	5·32
5/D ..	31	29·29	17,527	565·39	1,826·76	897·71	28·96	98·87	5·12
5/E ..	38	34·61	20,093½	528·78	1,763·14	978·95	25·76	91 25	4·87
5/R ..	70	58·68	28,958½	413·69	1,484·36	1,279·40	18·28	67·20	4·42
5/Z ..	41	35·97	26,681½	645·59	2,124·13	1,388 50	33·59	114·31	5·21
5/Ee .	16	16	11,020½	688·78	2,071·91	553·48	34·59	102 83	5·02
5/Xx	26	26	11,888½	457·25	1,475·99	611·86	23·53	73·18	5·15
5/Yy	10	6·48	2,243	224·85	1,026·32	118·12	11·85	53·59	5 31
5/Aaa	19	18·77	9,666½	508·76	1,816·72	463·56	24·40	89·38	4·80
5/Bbb	18	18	8,773	487·39	1,931·14	426·58	23·70	95·53	4·86
5/Eee	26	17·55	10,097	388·35	1,389·00	469·75	18·07	62·38	4·65
5/Hhh	14	13·06	7,590	542·14	1,914·03	311·39	22·24	79·37	4·10
5/Jjj	27	26·81	8,545½	316·50	1,438·44	571·38	21·16	90·07	6·69
5/Aa .	21	14·94	8,872	422·48	1,752·36	378·23	18·01	75·18	4·26
5/Kkk	17	14·71	5,615½	330·32	1,043·38	260·58	15·33	48·36	4·64
5/Lll	16	14·16	8,414	525·87	2,058·46	388·11	24·26	92·99	4·61
5/Rr	25	23·61	10,517	420·67	1,610·49	552·44	22·09	86·31	5·25
5/Mmm	32	30	22,010	687·81	2,193 21	1,058·23	33·07	104·20	4·81
5/Nnn	26	26	15,484½	595·56	1,976·57	771·16	29·66	99·45	4·98
5/Ooo	23	14·26	17,203	747·96	2,254·09	684·39	29·76	96·05	3·98
5/Ppp	29·94	23·23	11,891	397·16	1,726·14	464·91	15·53	70·44	3·91
5/Qqq	30	28·03	13,033	434·43	1,491·81	691·06	23·04	78·31	5·30
Means	26·91	23·91	1,371·63	509·78	1,766·70	667·43	24·81	87·08	4·87

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Dec.	Per Cow during Dec.	Per Cow March to Dec.	Per Herd during Dec.	Per Cow during Dec.	Per Cow March to Dec.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	30	22·94	13,348	444·93	4,388·27	663·92	22·13	222·95	4·97
9/C ..	16	14·32	7,503½	468·97	5,371·15	338·26	21·14	229·58	4·51
9/D ..	31·16	18·84	12,075½	387·53	4,133·35	610·55	19·59	225 39	5·06
9/E ..	14	12	11,919½	851·36	4,830·63	582·28	41·59	240 03	4·88
9/F ..	18	13·81	7,487½	415·97	4,918·83	348·13	19·34	220·15	4·65
9/G ..	32·61	27·61	21,819	669·00	5,476·35	1,087·15	33·33	278·82	4·98
9/I ..	29	29	18,398½	634·43	5,123·85	777·48	26·81	220·05	4·23
9/J...	11	9	8,060	732·72	5,757·33	335 12	30·47	243·00	4·16
9/L ..	33	21·61	7,578½	229·65	3,788·04	314·44	9·53	154 10	4 15
9/O ..	29·94	26·84	14,775½	493·49	5,182·84	646·30	21·59	236 82	4·37
9/P ..	44·74	43·84	17,862	399·17	4,720·96	908·52	20 30	241·14	5·09
9/T ..	20	19	14,108½	705·42	4,880·20	628·84	31·43	220·50	4·54
9/W .	28	16·39	12,661	452·17	5,521·48	529·46	18·91	236·03	4·18
9/X .	10·45	10·10	5,822	557·12	4,649·72	299·21	28·63	236·55	5·14
9/Y ..	11·65	8·35	6,402½	549·57	5,200·50	268·93	23·08	211·88	4·20
9/Z ..	14	12·74	5,960	425·71	3,482·21	332·44	23·75	180·18	5·58
9/Aa .	16·61	16·61	8,333	501·68	4,968·53	445·87	26·84	271·68	5·35
9/Bb .	29·13	25·77	16,666½	572·14	4,001·74	773·01	26·53	197·27	4·64
9/Ee .	35·90	31·16	15,100½	420·63	3,081·38	770·00	21·45	152·52	5·10
9/Co .	17	16	7,037	413·94	5,170·62	397·49	23·38	277·08	5·65
9/Ff .	3·10	·26	109	35·16	2,296·71	4·52	1·46	85·86	4·15
9/Dd	17	13·71	7,082½	416·62	2,833·44	296·79	17·46	131·71	4·20
Means	22·38	18·63	1,091·41	487·74	4,600·53	516·31	23·07	219·89	4·73

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs.	
		Progressive to 19th Jan., 1936.	Totals
B. Cooke, Kanmantoo.	1	98	
	2	124	
	3	162	384
	4	157	
	5	188	
	6	169	514
			898
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	164	
	14	—	
	15	164	328
	16	190	
	17	150	
	18	89	429
			757
H. F. Muirson, Yundi.	19	dead	
	20	142	
	21	77	219
	22	135	
	23	182	
	24	58	375
			594
E. McKee, 5, Rose Street, Carrondown.	25	158	
	26	dead	
	27	210	368
	28	197	
	29	189	
	30	191	577
			945
H. C. Stacy, Meadows.	31	87	
	32	109	
	33	167	363
	34	71	
	35	155	
	36	203	429
			792
T. Cleaver, Bridgewater.	37	96	
	38	135	
	39	93	324
	40	162	
	41	132	
	42	150	444
			768
C. Sandstrom, Yundi.	43	155	
	44	dead	
	45	dead	155
	46	73	
	47	97	
	48	139	309
			464

Competitor.	Bird No.	First Grade Eggs.	
		Progressive to 19th Jan., 1936.	Totals
A. J. Monkhouse, Woodside.	49	81	
	50	161	
	51	173	415
	52	192	
	53	115	
	54	172	479
			894
J. F. Smith, Meadows.	55	153	
	56	120	
	57	8	281
	58	138	
	59	47	
	60	162	347
			628
A. Young, Bridgewater.	61	172	
	62	161	
	63	153	486
	64	117	
	65	186	
	66	153	456
			942
R. W. McAlister, Yundi.	67	87	
	68	143	
	69	142	372
	70	131	
	71	81	
	72	160	372
			744
T. Duhring, Mallala.	73	186	
	74	dead	
	75	141	327
	76	71	
	77	76	
	78	101	248
			575
R. J. Underdown, Meadows.	79	50	
	80	114	
	81	182	346
	82	133	
	83	104	
	84	172	409
			755
S. Hill, Bridgewater.	85	138	
	86	181	
	87	139	458
	88	175	
	89	179	
	90	155	509
			967
W. R. Hedger, Yundi.	91	98	
	92	140	
	93	154	392
	94	137	
	95	125	
	96	151	413
			805

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
Langmaid & Bettison, Salisbury.	97	131	
	98	54	
	99	103	288
	100	163	
	101	66	
	102	3	232
			520
E. Portlock, Meadows.	103	183	
	104	159	
	105	163	505
	106	138	
	107	119	
	108	153	410
			915
Murray Powell, Jupiter Creek.	109	182	
	110	47	
	111	171	400
	112	146	
	113	178	
	114	37	361
			761
G. W. Bignell, Meadows.	115	170	
	116	136	
	117	137	443
	118	92	
	119	163	
	120	162	417
			860
W. M. Field, Yundi.	121	160	
	122	30	
	123	135	325
	124	98	
	125	66	
	126	154	318
			643
C. R. Wharton, Meadows.	127	160	
	128	169	
	129	187	516
	130	178	
	131	155	
	132	135	468
			984
H. H. Hefford, Murray Bridge.	133	150	
	134	164	
	135	161	475
	136	67	
	137	161	
	138	107	335
			810
F. W. Gage, Meadows.	139	144	
	140	5	
	141	dead	149
	142	152	
	143	141	
	144	102	395
			544
W. H. L. Norman, Echunga.	145	77	
	146	64	
	147	—	141
	148	189	
	149	148	
	150	91	428
			569
B. R. Whittington, Yundi.	151	132	
	152	99	
	153	145	376
	154	168	
	155	132	
	156	142	442
			818
B. C. Sanders, Meadows.	157	171	
	158	176	
	159	188	535
	160	165	
	161	108	
	162	dead	273
			808
H. H. Gallagher, Pooraka.	163	89	
	164	dead	
	165	158	247
	166	128	
	167	89	
	168	175	392
			639
W. Sickert, Meadows.	169	183	
	170	116	
	171	186	485
	172	132	
	173	136	
	174	157	425
			910
W. Restall, Echunga.	175	108	
	176	—	
	177	129	237
	178	163	
	179	144	
	180	119	426
			663
A. G. Dawes, 230, Portrush Road, Glenunga.	181	179	
	182	141	
	183	150	470
	184	118	
	185	95	
	186	177	390
			860
G. W. Sykes, Yundi.	187	157	
	188	95	
	189	96	348
	190	136	
	191	129	
	192	168	433
			781
R. Bartley, Meadows.	193	98	
	194	190	
	195	157	445
	196	115	
	197	149	
	198	159	423
			868
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	96	
	200	145	
	201	86	327
	202	143	
	203	93	
	204	95	331
			658

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
J. J. Devlin, Meadows.	205	147	
	206	160	
	207	197	504
	208	162	
	209	140	
	210	191	493
			997
D. J. Foxwell, Echunga.	211	113	
	212	144	
	213	46	303
	214	18	
	215	159	
	216	74	251
			554
F. J. Buck, Meadows.	217	150	
	218	165	
	219	174	489
	220	93	
	221	129	
	222	106	328
			817
J. A. Grist, Yundi.	223	55	
	224	106	
	225	138	299
	226	59	
	227	—	
	228	140	199
			498
L. A. King, Meadows.	229	164	
	230	162	
	231	dead	326
	232	66	
	233	dead	
	234	dead	66
			392
R. W. Sando, Echunga.	235	115	
	236	75	
	237	92	282
	238	117	
	239	106	
	240	110	333
			615
E. W. Young, Meadows.	241	172	
	242	134	
	243	153	459
	244	153	
	245	—	
	246	85	238
			697
A. Jarvis, Yundi.	247	157	
	248	89	
	249	134	380
	250	164	
	251	128	
	252	195	487
			867
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
S. Bridge, Yundi.	259	165	
	260	180	
	261	149	494
	262	103	
	263	148	
	264	133	384
			878
H. G. Egarr, Meadows.	265	135	
	266	85	
	267	dead	220
	268	20	
	269	117	
	270	41	178
			398
R. H. Smith, Yundi.	271	166	
	272	140	
	273	166	472
	274	178	
	275	48	
	276	166	392
			864
J. M. Lawson, Meadows.	277	176	
	278	178	
	279	129	483
	280	107	
	281	153	
	282	69	329
			812
J. O. Marshall, Yundi.	283	23	
	284	160	
	285	167	350
	286	145	
	287	167	
	288	82	394
			744
G. Joyce, Meadows.	289	14	
	290	193	
	291	80	287
	292	93	
	293	187	
	294	137	417
			704
J. A. Bradtke, Yongala.	295	12	
	296	—	
	297	156	
		168	
W. H. A. Hodgson, Salisbury.	298	162	
	299	172	
	300	176	
		510	
A. W. McDonald, Gawler.	301	60	
	302	144	
	303	158	
		362	
J. H. Dowling, Glossop.	304	140	
	305	147	
	306	21	
		308	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
A. P. Urlwin, **Balaklava.**	307	135	
	308	111	
	309	25	
		271	
L. S. Ekers, **Mount Compass.**	310	153	
	311	53	
	312	154	
		360	
V. E. Williams, **Semaphore Park.**	313	179	
	314	176	
	315	182	
		537	
F. P. Munzberg, **Tanunda.**	316	178	
	317	158	
	318	175	
		511	
Total Class 1		38,015	

Class 2—Any Other Light Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
Langmaid & Bettison, **Salisbury.** **(Black Minorcas.)**	319	105	
	320	72	
	321	153	
		330	
A. Heaysman, **Government Road,** **Eden Hills.** **(Cuckoo Leghorns.)**	322	158	
	323	189	
	324	120	
		467	
Total Class No. 2.		797	

Class No. 3—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
A. G. Dawes, 230, **Portrush Road,** **Glenunga.**	325	51	
	326	31	
	327	161	243
	328	124	
	329	116	
	330	146	386
			629
H. J. Mills, **108, Edward Street,** **Edwardstown.**	331	175	
	332	152	
	333	156	483
	334	144	
	335	175	
	336	dead	319
			802
K. Pennack, **Pooraka.**	337	143	
	338	117	
	339	83	343
	340	188	
	341	58	
	342	124	370
			713
H. H. Gallagher, **Pooraka.**	343	136	
	344	112	
	345	123	371
	346	131	
	347	114	
	348	42	287
			658
B. Cooke, **Kanmantoo.**	349	30	
	350	47	
	351	37	
		114	
H. H. Hefford, **Murray Bridge.**	352	136	
	353	107	
	354	63	
		306	
J. H. Dowling, **Glossop.**	355	115	
	356	43	
	357	135	
		293	
L. S. Ekers, **Mount Compass.**	358	135	
	359	90	
	360	151	
		376	
A. G. Dawes, **230, Portrush Road,** **Glenunga.**	452	87	
	453	124	
	454	112	323
	455	59	
	456	150	
	457	143	352
			675
A. P. Urlwin, **Balaklava.**	465	107	
	466	161	
	467	108	
		376	
Total Class No. 3		4,942	

Class No. 4.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
H. J. Mills, **108, Edward Street,** **Edwardstown.** **(Rhode Island Reds.)**	361	3	
	362	dead	
	363	77	80
	364	194	
	365	99	
	366	dead	293
			373
A. G. Dawes, **230, Portrush Road,** **Glenunga.** **(Rhode Island Reds.)**	367	90	
	368	123	
	369	86	299
	370	144	
	371	86	
	372	130	360
			659
F. F. Welford, **1, Ludgate Circus,** **Colonel Light Gardens.** **(Rhode Island Reds.)**	373	143	
	374	160	
	375	dead	303
	376	57	
	377	131	
	378	135	323
			626
V. F. Gameau, **Findon Road,** **Woodville.** **(Rhode Island Reds.)**	379	68	
	380	151	
	381	138	357
	382	112	
	383	25	
	384	79	216
			573

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
K. Pennack, Pooraka. (Barnevelders.)	385	147	
	386	117	
	387	114	378
	388	154	
	389	146	
	390	136	436
			814
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	458	19	
	459	112	
	460	127	258
	461	15	
	462	135	
	463	118	268
			526
Total Class No. 4			3,571

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.	
G. R. Cowell, Balhannah.	391	165	
	392	74	
	393	dead	239
	394	87	
	395	57	
	396	121	265
			504
A. J. Monkhouse, Woodside.	397	41	
	398	164	
	399	155	360
	400	91	
	401	150	
	402	156	397
			757
G. R. Cowell, Balhannah.	403	139	
	404	141	
	405	52	332
	406	137	
	407	89	
	408	dead	226
			558
Total Class No. 5			1,819

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.
W. R. Christie, Upper Mitcham.	409	114
	410	108
	411	108
		330
Total Class No. 7		330

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	127
	413	60
	414	115
		302
Total Class No. 8		302

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.
Peter Western, Ascot Park School. (White Leghorn.)	415	182
Peter Western, Ascot Park School. (White Leghorn.)	416	175
William Sando, Echunga School. (White Leghorn.)	417	161
Douglas Marshall, Yundi School. (White Leghorn.)	418	165
Norman Page, Murray Bridge School. (White Leghorn.)	419	157
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	132
Dean Colwell, Grange School (White Leghorn.)	421	133
Warren Hannaford, Paracombe School (White Leghorn.)	422	188
W. Horne, Woodville School. (White Leghorn.)	423	dead
Owen Robinson, Ascot Park School. (White Leghorn.)	424	154
June Chapman, Woodchester School. (White Leghorn.)	425	141
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	95
Jack O'Sullivan, Morphett Vale School. (White Leghorn.)	427	122
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	64
James Taylor, Morphett Vale School. (White Leghorn.)	429	163
William Gregory, Victor Harbour School. (White Leghorn.)	430	134
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	142
Clifford Burford, Smithfield School. (White Leghorn.)	432	102
Tom Callaghan, Smithfield School. (White Leghorn.)	433	41
Eric Pratt, Abattoirs School. (White Leghorn.)	434	196
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	168
Alan Yelland, Cunliffe School. (Minorca.)	436	97
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	175

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 19th Jan., 1936.
Clarence King, Tarlee School. (White Leghorn.)	438	80
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	114
Donald Heading, Sturt School. (Black Orpington.)	440	156
Olive Steer, Sturt School. (Black Orpington.)	441	147
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	169
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	145
Ray Candy, Noarlunga School. (Black Orpington.)	444	65
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	158
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	141
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	43
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	69
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	133
John Keldoulis, Orroroo School. (Black Orpington.)	450	155
Bruce Dooland, Thebarton School. (Black Orpington.)	451	131
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	99
Total		4,892

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April, 1935, to 31st January, 1936.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 31st December, 1935.	No. Eggs Laid Month of January, 1936.	Total Eggs Laid 1st April, 1935, to 31st January, 1936.
No. 1 Test	5,508	675	6,183
No. 2 Test	5,713	734	6,447
No. 3 Test	5,936	791	6,727
No. 4 Test	4,925	538	5,463
No. 5 Test	5,052	547	5,599

DEPARTMENT OF AGRICULTURE.

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

Conducted at Parafield Poultry Station.

LEADING SCORES TO WEEK ENDED 19TH *JANUARY,* 1936.
FIRST GRADE EGGS ONLY.

SECTION I.—WET MASH.

Class 1.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
E. McKee	210	27
H. C. Stacy	203	36
E. McKee	197	28
J. J. Devlin	197	207
Trios—		
E. McKee	577	28–30
V. E. Williams	537	313–315
B. C. Sanders	535	157–159
Teams—		
J. J. Devlin	997	205–210
C. R. Wharton	984	127–132
S. Hill	967	85–90

Class 2.—*Any other Light Breed.*

	Eggs Laid.	Bird Nos.
Singles—		
A. Heaysman (Cuckoo Leghorn)	189	323
A. Heaysman (Cuckoo Leghorn)	158	322
Langmaid and Bettison (Black Minorca)	153	321

Class 3.—*Black Orpingtons.*

	Eggs Laid.	Bird Nos.
Singles—		
K. Pennack	188	340
H. J. Mills	175	335
A. G. Dawes	175	331
Trios—		
H. J. Mills	483	331–333
A. G. Dawes	386	328–330
A. P. Urlwin	376	465–467
L. S. Ekers	376	358–360
Teams—		
H. J. Mills (only 5 birds)	802	331–336
K. Pennack	713	337–342
A. G. Dawes	675	452–457

Class 4.—*Any other Heavy Breed.*

	Eggs Laid.	Bird Nos.
Singles—		
H. J. Mills (Rhode Island Red)	194	364
F. F. Welford (Rhode Island Red)	160	374
K. Pennack (Barnevelders)	154	388
Trios—		
K. Pennack (Barnevelders)	436	388–390
K. Pennack (Barnevelders)	378	385–387
A. G. Dawes (Rhode Island Reds)	360	370–372

Class 4.—*Any other Heavy Breeds*—continued.

Teams—	Eggs laid.	Bird Nos.
K. Pennack (Barnevelders)	814	385–390
A. G. Dawes (Rhode Island Reds)	659	367–372
F. F. Welford (Rhode Island Reds, only 5 birds)	626	373–378

SECTION II.—DRY MASH.

Class 5.—*White Leghorns.*

Singles—		
G. R. Cowell	165	391
A. J. Monkhouse	164	398
A. J. Monkhouse	156	402
Trios—		
A. J. Monkhouse	397	400–402
A. J. Monkhouse	360	397–399
Teams—		
A. J. Monkhouse	757	397–402
G. R. Cowell (only 5 birds)	558	403–408

Class 7.—*Black Orpingtons.*

Singles—		
W. R. Christie	114	409

Class 8.—*Any other Heavy Breed.*

W. R. Christie (Rhode Island Red)	127	412

SECTION III.—WET MASH.

Eric Pratt, Abattoirs (White Leghorn)	196	434
Warren Hannaford, Paracombe (White Leghorn)	188	422
Peter Western, Ascot Park (White Leghorn)	182	415
Peter Western, Ascot Park (White Leghorn)	175	416
Gordon Gallasch, Gilles Plains (White Leghorn)	175	437
Herbert Oliver, McLaren Vale (Black Orpington)	169	442

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on 29th January, there being present Hon. A. L. McEwin, M.L.C. (Chairman), Messrs. A. M. Dawkins, H. N. Wicks, F. Coleman, S. Shepherd, P. J. Baily, A. J. A. Koch, G. Jeffrey, Prof. A. J. Perkins (Director of Agriculture), Dr. A. E. V. Richardson (Director, Waite Research Institute), and H. C. Pritchard (Secretary). Apologies were received from Messrs. J. W. Sandford, J. B. Murdoch, and A. J. Cooke.

Life Members.—In recognition of 20 years' association with the Agricultural Bureau, the names of Messrs. A. T. Cowley (Roberts and Verran) and L. J. Cook (Kybybolite) were added to the roll of Life Members of the Agricultural Bureau.

New Branches.—Approval was given for the formation of a Women's Branch of the Agricultural Bureau at Georgetown with the following ladies as foundation members:—Mesdames J. Lyons, W. Sanders, V. Todd, R. Treasure, M. McAuley, J. Noonan, G., P., and D. Smallacombe, C. Wilkins, W. McNamara, T. M. Wyatt, J. Carmody, W. Odgers, E. Buckenara, J. Bond, A. Crawford, Misses N. & J. Crawford, L. Noonan, K. Bond, E. McAuley, R. and M. Ingles, I. Wilkins, K. Miller, D. Smallacombe, D. McNamara, M. Higgins (2), C. Carmody, C. Odgers, T. Buckenara, M. Phillis.

New Members.—The following names were added to the rolls of existing Branches:—Adelaide—H. Fairbank, N. P. Hele, F. Shaw, D. J. Chancellor, D. J. Millard, H. O. Rogers, A. E. Baker; Balhannah—W. W. Miller, E. H. Schmidtke, L. Nagel, A. Nagel, S. Petersen; Balumbah Women's—Mrs. F. M. Clements; Belalie Women's—Mrs. R. Goldsack; Black Springs—Reg. Heinrich, John Heinrich; Boor's Plains—Ken. Vidal; Buchanan—Fredk. C. Reichelt, Wm. J. Holding; Bute—J. H. E. Purdie, R. W. Langman, W. N. Trengove, C. Measday, A. Sawley; Butler—B. D. Teakle, Rex B. Teakle; Collie—E. C. Shipard, W. Shipard, R. L. Dolphin, T. G. Dolphin; Coonawarra—Leonard Clayfield, E. A. Childs, Chas. Soper, H. N. Brown, D. N. McGillivray, N. J. McBain, Miles Geraghty (jun.); Coonawarra Women's—Mrs. Chas. Soper; Cungena—A. Taylor, W. A. White; Dudley—E. Possingham, R. K. Henderson; Frayville—A. C. Bormann, J. H. A. Wegener, C. B. Pfeiffer, G. A. Quast; Goode—J. Cooper; Goode Women's—Miss M. Lutz; Hanson—A. B. Riggs, W. S. Field, E. Phillips, H. F. Saunders, Mrs. D. G. Stevens; Hartley—L. G. Brook; Hope Forest Women's—Mrs. B. M. Dodd; Inman Valley—J. M. Westlake, G. Newberry; Jervois—H. H. Jenico, A. O. Janico, N. Anjou, W. Gregory; Kilkerran—V. Glasohm; Koppio—C. Cooper, F. Whittaker, E. Wait; Kybybolite—R. Hutchins, O. W. Corbin; Kybybolite Women's—Mrs. D. H. Irving; Longwood—E. W. Pfenning; McLaren Flat—Fordo Trott, Ronald Ward, F. B. Wilson, Ron. G. Nottage, E. M. Elsworthy, L. A. Preedy, F. Holm, F. K. Smith, A. J. Whiting, J. Dowdell; Milang—J. McCarthy; Millicent Women's—Miss Yvonne Varcoe; Monarto South Women's—Mrs. A. H. Schubert, Miss M. Stevens, Miss R. Hartmann; Morchard Women's—Mrs. C. Koch, Miss M. Koch; Mount Barker—J. Lucie, F. Spicer; Myponga — — Bounds, — Thomas; Sheoak Log Women's—Mrs. — Schwartz; Springton—V. H. Mueller; Strathalbyn—Harold J. Stowe, Les. Halls; Tatiara—L. J. Young, E. Fridd, R. Fridd, W. Fridd, R. C. Allen, D. J. O'Liffe, R. W. R. Hunt, A. A. Pitcher; Warramboo—E. Adams, W. W. Adams; Wasleys Women's—Miss E. Fagg; Wepowie—Harold Wm. Symes, Eric J. Martin, E. P. Yeatman, L. H. Pascoe; Wepowie Women's—Mrs. L. Pascoe, Miss S. Gregurke, Mrs. J. Crocker, Mrs. A. M. Ware; Williamstown—N. V. Wilson, Joe. Buckley, Clarence Vinall; Wirrabara Women's—Mrs. H. H. T. McLean, Mrs. D. Deer, Mrs. C. Hollit, Miss Grace Horner.

Barley.—The following advice was received from the Comptroller-General of Customs in reply to a request for information concerning trade arrangements with Belgium in relation to the export of barley:—"The provisional Trade Agreement concluded on 19th November, 1934, by the Governments of Australia and Belgium is still in force and, under the terms of the Agreement, is subject to denunciation on two months' notice by either party." Received.

Noxious Weeds.—At the October meeting the Board forwarded a resolution to the Hon. Minister suggesting that the eradication of noxious weeds afforded an opportunity to give valuable work to unemployed. This was referred by the Minister to the Noxious Weeds Committee, and the Chairman replied as follows:—"Consideration was given to the resolution of the Advisory Board of Agriculture, and the Committee decided to recommend to the Minister that a reply should be sent to the Advisory Board that the Committee considered that to enable any great advance to be made in the eradication of noxious weeds throughout the State, it is essential that public opinion, which is at present apathetic, should be aroused to the necessity of coping with the problem, and that in this regard the local Branches of the Agricultural Bureau could render very valuable service." It was decided that the Secretary should suggest to Branches of the Bureau that the reply from the Noxious Weeds Committee be brought under the notice of local District Councils.

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1936.

Eggs for Hatching and Day Old Chickens

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30s. per 100.

DAY OLD CHICKENS.—15s. per dozen; £3 10s. in lots of 100.

BLACK ORPINGTONS.

EGGS.—10s. per Setting of 15 Eggs. Incubator Lots, £2 per 100.

DAY OLD CHICKENS.—17s. 6d. per dozen ; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30s. per 100.

DAY OLD CHICKENS.—15s. per dozen; £3 10s. in lots of 100.

Free on Rail, Salisbury. DELIVERY.—CHICKS—January to March.
EGGS—January to February.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2oz., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

LIST OF PUBLICATIONS OF THE DEPARTMENT OF AGRICULTURE.

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"First Aid to the Horse" by F. E. Place, B.V.Sc., M.R.C.V.S. Price 3s., Posted, 3s. 2d.

"Journal of the Department of Agriculture"—Subscription 5s. per annum to addresses in South Australia, elsewhere 10s. per annum. Members of the Agricultural Bureau of S.A., 2s. per annum. Single Copies, 1s. each.

Dentists Visiting Country Schools.—In response to a Congress resolution asking that the Government consider sending a dentist to country schools at least one visit annually, the Director of Education reported to the Minister that the Department had two dentists and two dental assistants, that the children of certain schools had been treated during the past 18 months, and that most of the work had been done in the country. He added that his Department was unaware of any State in which all the country schools were visited by a Government dentist each year. With the present staff, it was impracticable to consider the request of Congress. (The schools referred to are Springton, hundred of Jutland, Kenton Valley, Gumeracha, Forreston, Cromer, Birdwood High, Charleston, Mount Torrens, Harrogate, Murdoch's Hill, Littlehampton, Wistow, Mount Barker High, Mount Barker Probationary, Boolgun, Holder Siding, Kanni West, Murray View, Maggea, Taylorville, New Well, Holder, Ramco, Loveday, Wattle Flat, Inman Valley, Torrens Vale, Myponga, Delamere, Hindmarsh Tiers, Hope Forest, Mount Compass, Sellick's Hill, Aldinga, Yundi, Honiton, Coobowie, Lake Sunday, Sunbury, Oaklands, Pickering, Moorowie, Brentwood, Rocky Beach, Minlacowie South, Weavers, Bublacowie, Cranbrook, Mount Rat, Roolama, Raeburn.) It was decided that the reply from the Director of Education should be published in the *Journal of Agriculture.*

Yard Fees at Country Markets.—The Secretary of the South Australian Stocksalesmen's Association intimated that the request to review the yard fees at country markets had been discussed by his Association, and it was agreed to adhere to the present arrangements. The advice was received.

Sheep Dipping.—In reply to the request of the Yeelanna Conference the Minister informed the Board that approval had been given to the appointment of Mr. N. V. Sedunary as an Inspector of Stock at Port Lincoln. Mr. Sedunary would, among other duties, take the necessary action for the control of lice and tick in sheep, and enforce the provisions of the Brands Act, 1923.

Instructor for Murray Swamp Areas.—The Secretary reported that applications had been called for an Agricultural Instructor for the reclaimed Murray Swamp Lands.

Rust in Wheat.—The Ungarra Branch submitted the following resolution:—"That the Department be urged to concentrate on fighting the rust menace as a vital step in the all-round improvement of our wheat." Professor Perkins stated that the problem of rust in wheat was being investigated scientifically by the New South Wales Department of Agriculture, and that one could not expect such work to be duplicated in each State. Dr. Richardson said the breeding of rust-resisting varieties of wheat was part of the programme of the work being done by the Wheat Improvement Committee in South Australia, which was established by the Minister. The Secretary was instructed to advise the Branch in terms of the above statements.

Young People's Employment Council.—The Secretary read a report, for the information of the Board, of the Conference held in November.

Non-irrigated Fruitgrowing Districts Conference.—The Greenock Branch offered to sponsor the next Conference of Branches in the non-irrigated districts. (At the Conference held in November none of the branches offered to hold next year's Conference.) The Board accepted the offer of the Greenock Branch.

Next Meeting of the Board.—It was decided that the February meeting of the Board should be held at the Blackwood Orchard.

Several items were taken in Committee.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & Co., LIMITED, reported on 1st February, 1935:—

BUTTER.—The production of butter in South Australia has been gradually declining for many weeks past, and there is not now sufficient choicest being manufactured in this State to meet the current demands for print butter. Consequently, importations from Victoria are now necessary. On the other hand, there is a surplus each week of lower grades which must be packed for overseas. Under the equalisation plan rates in the local market have remained unchanged, although farmers have had advanced prices paid for butterfat. The London market has improved in values during the last week, but, unfortunately, the quantities to go forward to meet the favourable market are only small. Present local rates are:—Choicest creamery fresh butter in bulk, 1s. 3¼d. per lb. Prints and delivery extra. (This price is for local sale only, and under the quota system the equalised price manufacturers will receive will be 1s. 0¾d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines from 10½d. to 11½d. per lb. for choicest; stores, 6d. to 8d. per lb. (These prices are subject to equalisation levies.)

CHEESE.—Reports from the South-Eastern factories indicate that the milk supplies are now falling back very rapidly, but this was only to be expected after the high productivity earlier in the season. Westralain buyers have resumed purchasing and local trade has been well maintained, but there is still a surplus available for export. Local prices have continued without alteration at:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. 1d. to 1s. 1½d. per lb.

EGGS.—Although supplies are lessening each week there are more than sufficient for local needs but, unfortunately, a large proportion of the eggs arriving in Adelaide during the past few weeks have been of very poor quality and not suitable for cafe or shop trade. For good quality eggs the demand has been well maintained and values firmed. Ordinary country eggs, fair average quality, from 4d. per doz. net; long distance rail or shipping eggs lower; selected new laid, clean eggs, full sized, 8½d. to 9d. per doz. net.

BACON.—During the warm spells the demand for bacon weakened, but trade generally was satisfactory all things considered. A strong demand continued for bacon factory smallgoods, and cooked hams are selling well. Rates are:—Best quality sides, 9d. to 9½d. per lb.; middles, 9½d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 1s. 0½d. to 1s. 1d.; cooked, 1s. 3d. to 1s. 3½d. per lb.; lard, bulk, 5d. to 5½d.; prints, 6d. to 6½d. per lb.

ALMONDS.—Supplies of the new crop are now coming to hand each week, although they are not very great as yet. Where the almonds were thoroughly dried out there were ready sales, and quotations are unchanged at:—Softshells and Brandis, 9d. to 9½d.; hardshells, 5¼d. to 5½d.; kernels, 1s. 10d. to 1s. 10½d. per lb.

HONEY.—Only a limited demand was experienced for honey throughout the month, and heavy quantities were carried over from week to week. The outlook for the disposal of large quantities is not very promising unless some overseas outlet can be obtained, as there seems little likelihood of it being disposed of in Australia. Rates are:—Prime quality clear extracted, 2d. to 2½d. per lb.; lower grades, 1d. to 2d. per lb.

BEESWAX.—Has been somewhat dull of sale for a few weeks, but demand is expected to improve shortly. Quotations are:—1s. 2½d. to 1s. 3½d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms, which are in every way the best equipped in the State. The markets have been fairly well supplied since Christmas, and for good quality lots prices continue satisfactory. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. 6d. to 4s. 9d.; nice-conditioned cockerels, 2s. 8d. to 3s. 5d.; fair-conditioned cockerels, 2s. to 2s. 7d.; chickens lower; heavyweight hens, 2s. to 2s. 10d.; medium hens, 1s. 6d. to 1s. 11d.; light hens, 9d. to 1s. 4d.; couple of pens of weedy sorts, lower; prime young muscovy drakes, 3s. 3d. to 4s. 6d.; young muscovy ducks, 1s. 9d. to 2s. 6d.; ordinary ducks, 1s. to 2s.; ducklings, lower; geese, 2s. to 3s. 6d.; goslings, lower; turkeys, good to prime condition, 9s. to 1s. per lb. live weight; turkeys, fair condition, 7d. to 8½d. per lb. live weight; turkeys, poor and crooked breasted, lower; pigeons, 4½d. each.

POTATOES.—New season's, 7s. per cwt.

ONIONS.—New season's, 8s. 6d. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of January, 1936, and also the average precipitation for January, and the average annual rainfall.

Station.	Jan. 1936.	Av'ge. for Jan.	Av'ge. Annual Rainfall.
Far North and Upper North.			
Oodnadatta	0·58	0·54	4·62
Marree	0·64	0·38	5·83
Farina	0·43	0·48	6·37
Copley	1·00	0·53	7·85
Beltana	1·51	0·63	8·47
Blinman	1·23	0·88	11·81
Hookina	2·20	0·44	11·18
Hawker	0·96	0·55	12·22
Wilson	2·11	0·56	11·77
Gordon	0·86	0·57	10·46
Quorn	0·64	0·62	13·15
Port Augusta	2·16	0·51	9·40
Bruce	3·83	0·41	9·74
Hammond	1·93	0·56	11·11
Wilmington	2·16	0·77	17·28
Willowie	1·06	0·44	12·22
Melrose	1·81	1·13	22·85
Booleroo Centre	1·06	0·74	15·21
Port Germein	1·47	0·60	12·53
Wirrabara	0·59	0·69	19·25
Appila	1·24	0·62	14·62
Cradock	0·84	0·57	10·78
Carrieton	1·55	0·71	12·19
Johnburg	1·81	0·55	10·56
Eurelia	1·96	0·72	12·76
Orroroo	1·33	0·92	13·20
Nackara	3·81	0·66	11·09
Black Rock	1·76	0·66	12·35
Oodlawirra	2·03	0·56	11·67
Peterborough	1·93	0·77	13·22
Yongala	2·96	0·63	14·43
North-East.			
Yunta	1·58	0·58	8·48
Waukaringa	1·88	0·46	7·89
Mannahill	0·78	0·60	8·16
Cockburn	2·10	0·57	7·91
Broken Hill	1·85	0·63	9·50
Lower North.			
Port Pirie	3·74	0·59	13·19
Port Broughton	1·12	0·56	13·85
Bute	1·98	0·54	15·39
Laura	2·62	0·69	17·97
Caltowie	1·22	0·67	16·76
Jamestown	1·65	0·66	17·72
Gladstone	1·13	0·65	16·32
Crystal Brook	2·46	0·64	15·76
Georgetown	1·40	0·66	18·29
Narridy	0·76	0·52	15·77
Redhill	3·61	0·54	16·54
Spalding	0·94	0·58	18·74
Gulnare	0·97	0·62	18·59
Yacka	0·84	0·48	15·38
Koolunga	0·98	0·57	15·32
Snowtown	3·09	0·56	15·70
Lower North—*continued.*			
Brinkworth	0·61	0·50	15·73
Blyth	1·72	0·65	16·73
Clare	2·42	0·85	24·45
Montaro	1·49	0·63	23·36
Watervale	2·49	0·89	26·74
Auburn	3·01	0·94	23·96
Hoyleton	2·05	0·71	17·27
Balaklava	0·75	0·65	15·43
Port Wakefield	1·67	0·54	12·93
Terowie	4·20	0·68	13·34
Whyte-Yarcowie	4·85	0·67	13·58
Hallett	1·59	0·67	16·41
Mount Bryan	1·36	0·55	16·77
Kooringa	2·12	0·70	17·81
Farrell's Flat	2·96	0·70	18·54
West of Murray Range.			
Manoora	1·31	0·61	18·94
Saddleworth	1·97	0·73	19·59
Marrabel	1·24	0·72	19·96
Riverton	1·50	0·74	20·79
Tarlee	1·29	0·73	18·09
Stockport	1·77	0·70	16·97
Hamley Bridge	2·01	0·73	16·52
Kapunda	1·84	0·82	19·76
Freeling	1·18	0·72	17·79
Greenock	1·27	0·77	21·47
Truro	2·13	0·70	19·79
Stockwell	1·68	0·69	20·04
Nuriootpa	1·50	0·77	20·68
Angaston	2·22	0·77	22·32
Tanunda	1·26	0·84	21·94
Lyndoch	0·81	0·74	23·27
Williamstown	0·46	0·92	27·61
Adelaide Plains.			
Owen	1·50	0·40	14·64
Mallala	1·10	0·68	16·49
Roseworthy	0·86	0·70	17·42
Gawler	1·69	0·71	18·85
Two Wells	0·91	0·63	15·76
Virginia	1·75	0·66	17·20
Smithfield	0·45	0·52	17·65
Salisbury	0·40	0·69	18·56
Adelaide	1·45	0·72	21·14
Glen Osmond	1·57	0·89	25·97
Magill	1·02	0·82	25·37
Mount Lofty Ranges.			
Teatree Gully	0·74	0·80	27·07
Stirling West	1·13	1·50	46·95
Uraidla	1·05	1·31	43·95
Clarendon	0·66	1·07	32·79
Happy Val'y Res.	0·86	—	—
Morphett Vale	0·60	0·73	22·59
Noarlunga	0·78	0·58	20·33
Willunga	0·83	0·76	25·97
Aldinga	0·48	0·55	20·21

RAINFALL—*continued.*

Station.	Jan. 1936.	Av'ge. for Jan.	Av'ge. Annual Rain-fall.
MOUNT LOFTY RANGES—*continued.*			
Myponga	0·72	0·71	29·42
Inman Valley	1·17	—	—
Yankalilla	0·75	0·57	22·76
Mount Compass	1·18	—	—
Mount Pleasant	2·56	0·86	27·11
Birdwood	1·07	1·00	29·07
Gumeracha	0·64	1·07	33·31
Millbrook Res.	0·61	1·14	34·47
Tweedvale	0·94	1·02	35·91
Woodside	1·41	0·98	32·15
Ambleside	0·82	1·06	34·77
Nairne	1·86	0·96	28·12
Mount Barker	1·69	1·02	31·24
Echunga	1·88	1·05	33·25
Macclesfield	3·07	0·90	30·34
Meadows	2·10	1·03	36·02
Strathalbyn	1·80	0·69	19·32
MURRAY FLATS AND VALLEY.			
Meningie	1·20	0·61	18·31
Milang	0·98	0·58	14·89
Langhorne's Ck	1·33	0·46	14·91
Wellington	1·47	0·70	14·65
Tailem Bend	2·76	0·52	15·06
Murray Bridge	1·63	0·54	13·51
Callington	1·45	0·66	15·15
Mannum	1·31	0·49	11·48
Palmer	2·03	0·57	15·59
Sedan	1·49	0·57	12·05
Swan Reach	2·37	0·45	10·65
Blanchetown	3·38	0·66	11·01
Eudunda	2·70	0·68	17·15
Point Pass	2·38	0·49	16·72
Sutherlands	2·82	0·38	10·81
Morgan	1·84	0·48	9·16
Waikerie	3·86	0·36	9·66
Overland Corner	3·65	0·48	10·25
Loxton	2·83	0·55	11·50
Berri	3·30	0·45	10·13
Renmark	4·04	0·46	10·38
WEST OF SPENCER'S GULF.			
Eucla	0·16	0·57	10·02
Nullarbor	0·11	0·35	8·85
Fowler's Bay	0·08	0·36	11·91
Penong	0·27	0·29	12·22
Koonibba	0·27	0·27	12·09
Denial Bay	0·12	0·20	11·19
Ceduna	0·19	0·20	10·21
Smoky Bay	—	0·23	10·42
Wirrulla	—	0·13	10·51
Streaky Bay	0·01	0·39	14·85
Chandada	—	0·20	12·42
Minnippa	0·11	0·53	13·91
Kyancutta	0·64	0·19	12·77
Talia	—	0·24	14·76
Port Elliston	0·07	0·36	16·51
Lock	1·55	0·40	16·34
Mount Hope	—	—	—
Yeelanna	0·02	0·21	15·94
Cummins	0·14	0·33	17·58
Port Lincoln	0·44	0·55	19·37
Tumby	0·26	0·29	14·25
Ungarra	0·40	0·31	16·87
Port Neil	0·22	0·30	13·11
WEST OF SPENCERS GULF—*continued.*			
Arno Bay	0·73	0·36	12·71
Rudall	1·24	0·41	12·98
Cleve	2·48	0·49	14·88
Cowell	1·40	0·43	11·07
Miltalie	1·93	0·50	13·70
Mangalo	4·64	0·44	13·86
Darke's Peak	2·02	0·50	15·08
Kimba	0·73	0·29	11·68
YORKE PENINSULA.			
Wallaroo	1·44	0·51	13·97
Kadina	1·38	0·49	15·60
Moonta	1·27	0·49	15·06
Paskeville	5·27	0·46	15·47
Maitland	0·73	0·59	19·85
Ardrossan	0·57	0·46	13·95
Port Victoria	0·14	0·44	15·41
Curramulka	0·16	0·55	17·81
Minlaton	0·16	0·49	17·74
Port Vincent	0·42	0·38	14·38
Brentwood	0·09	0·34	15·54
Stansbury	0·41	0·54	16·81
Warooka	0·21	0·42	17·44
Yorketown	0·27	0·45	16·83
Edithburgh	0·24	0·48	16·37
SOUTH AND SOUTH-EAST.			
Cape Borda	1·09	0·58	24·80
Kingscote	0·85	0·44	19·16
Penneshaw	0·48	0·41	19·00
Victor Harbour	1·50	0·67	21·40
Port Elliot	1·46	0·63	19·94
Goolwa	2·03	0·64	17·86
Maggea	3·96	0·59	10·20
Copeville	4·17	0·43	11·53
Claypans	2·89	0·64	10·42
Meribah	3·00	0·59	11·32
Alawoona	3·40	0·64	10·40
Caliph	2·68	0·63	10·98
Mindarie	2·72	0·53	12·23
Sandalwood	3·84	0·61	13·64
Karoonda	2·90	0·46	14·17
Pinnaroo	3·19	0·43	14·36
Parilla	2·85	0·41	13·72
Lameroo	2·67	0·53	15·87
Parrakie	2·44	0·42	14·56
Geranium	2·71	0·44	16·36
Peake	1·69	0·55	15·93
Cooke's Plains	3·40	0·51	15·28
Coomandook	2·32	0·47	17·03
Coonalpyn	1·76	0·73	17·61
Tintinara	1·47	0·47	18·62
Keith	1·60	0·42	17·93
Bordertown	1·43	0·70	19·14
Wolseley	1·41	0·58	18·47
Frances	1·43	0·65	20·08
Naracoorte	1·21	0·77	22·63
Penola	0·77	1·00	25·96
Lucindale	1·89	0·69	23·38
Kingston	1·64	0·71	24·24
Robe	1·34	0·75	24·64
Beachport	1·38	0·82	27·06
Millicent	2·15	0·93	29·83
Kalangadoo	1·08	1·11	32·20
Mount Gambier	1·02	1·30	30·37

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		March	April
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	*	6	3
Alma	*	—	—
Angaston	*	—	—
Appila-Yarrowie	*	6	3
Arthurton	*	—	—
Ashbourne	*	4	1
Auburn Women's	*	27	24
Balaklava	*	23	27
Balhannah	*	—	—
Balhannah Women's	1000	—	—
Balumbah	*	—	—
Balumbah Women's	*	4	1
Barmera	*	—	—
Baroota	994	9	13
Beetaloo Valley	*	2	6
Beetaloo Valley Women's	*	—	—
Belalie Women's	*	10	14
Belvidere	*	—	—
Berri	*	2	6
Blackheath	998	12	9
Black Rock	*	—	—
Black Springs	997	—	—
Blackwood	*	9	13
Block E	*	—	—
Blyth	*	27	24
Booborowie	*	2	6
Booleroo Centre	*	27	24
Boolgun	*	—	—
Boor's Plains	*	—	—
Boor's Plains Women's	*	—	—
Brentwood	*	2	6
Brimpton Lake	*	—	—
Brinkley	*	4	1
Brownlow	*	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	19	16
Butler	997	—	—
Calca	*	—	—
Caliph	*	3	7
Carey's Gully	*	—	—
Chandada	*	—	—
Chapman's Bore	*	9	6
Cherry Gardens	996	7	4
Chilpuddie Rock	*	—	—
Clare Women's	999	7	4
Clarendon	*	30	28
Collie	*	4	1
Coomandook	*	27	24
Coonalpyn	991	—	—
Coonalpyn Women's	*	4	1
Coonawarra	*	5	9
Coonawarra Women's	1000	19	16
Cummins	*	13	10
Cungena	*	5	2
Currency Creek	*	9	6
Devlin's Pound	*	—	—
Devlin's Pound Women's	*	11	8
Dudley	*	—	—
Echunga	*	11	8
Eurelia	*	14	11
Eurelia Women's	*	4	1
Finniss	*	—	—
Frayville	*	—	—
Gawler River	*	—	—
Georgetown Women's	999	10	14
Gladstone	*	6	3
Gladstone Women's	*	13	21
Goode	*	—	—
Goode Women's	*	—	—
Green Patch	994	5	2
Greenock	*	16	20
Gumeracha	*	9	6
Hanson	*	3	7
Hartley	995	4	1
Hilltown	*	3	7
Hindmarsh Island	*	—	—
Hope Forest	998	2	6
Hope Forest Women's	*	—	—
Inman Valley	*	19	16
Iron Bank	998	4	8
Jamestown	995	18	15
Jervois	*	12	9
Kalangadoo	*	14	11
Kalangadoo Women's	*	14	11
Kangarilla Women's	*	19	16
Kanni	*	—	—
Karte	*	—	—
Karte Women's	998	—	—
Kelly	*	7	4
Ki Ki	*	—	—
Kilkerran	997	5	2
Koolunga	*	—	—
Koonunga	*	—	—
Koppio	997	11	8
Kulkawirra	*	10	14
Kyancutta	999	3	7
Kybybolite	*	5	2
Kybybolite Women's	1000	10	8
Lameroo	*	7	4
Laura	*	7	4
Laura Bay	997	10	14
Laura Bay Women's	1000	14	11
Lenswood and Forest Range	*	—	—
Light's Pass	992	—	—
Lipson	*	7	4
Lone Gum and Monash	*	19	16
Lone Pine	*	2	6
Longwood	998	—	—
Lyndoch	*	3	7
MacGillivray	*	3	7
McLaren Flat	*	—	—
McLaren Flat Women's	*	5	2
Maltee	*	5	2
Maltee Women's	*	—	—
Mangalo	*	—	—
Mangalo Women's	*	11	8
Marama	*	—	—
Milang	*	7	—
Millicent	*	27	25
Millicent Women's	*	—	—
Miltalie	*	7	4
Minnipa	*	—	—
Monarto South	998	—	—
Monarto South Women's	998	21	18
Moorlands	*	11	8
Moorook	*	—	—
Morchard	*	6	3
Morchard Women's	1000	25	22
Mount Barker	*	16	20
Mount Bryan	*	—	—
Mount Compass	998	—	—
Mount Gambier	993	13	10
Mount Hope	*	3	7
Mount Pleasant	*	4	1
Mudamuckla	*	14	11
Mudamuckla Women's	*	—	—

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.	
		March	April
Mundalla	*	—	—
Mundalla Women's	*	5	9
Murray Bridge	*	—	—
Murraytown	*	—	—
Mypolonga	*	—	—
Myponga	*	19	16
Myponga Women's	998	12	9
Nantawarra	*	5	2
Narridy	*	—	—
Narridy Women's	*	—	—
Narrung	*	—	—
Nelshaby	*	—	—
Nelshaby Women's	*	—	—
Nunjikompita	*	5	2
Nunkeri	*	5	2
O'Loughlin	*	9	13
O'Loughlin Women's	*	—	—
Owen	*	9	13
Palabie	*	—	—
Parilla	*	17	21
Parilla Women's	*	18	15
Parilla Well	*	9	6
Parilla Well Women's	*	31	28
Parrakie	*	—	—
Parrakie Women's	*	31	28
Paskeville	*	3	7
Penola	*	7	4
Penola Women's	*	—	—
Penwortham	997	4	1
Petina	*	28	25
Pinbong	*	—	—
Pinbong Women's	*	—	—
Pinkawillinnie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	*	6	8
Port Elliot	*	—	—
Pygery	991	3	7
Pygery Women's	*	10	14
Ramco	*	2	6
Redhill	*	—	—
Rendelsham	*	5	2
Rendelsham Women's	*	—	—
Renmark	*	—	—
Riverton	*	9	13
Roberts and Verran	997	—	—
Rosedale	*	—	—
Roseworthy	*	—	—
Saddleworth	*	6	10
Saddleworth Women's	*	3	7
Scott's Bottom	*	7	4
Sheoak Log Women's	*	—	—
Shoal Bay	*	3	7
Snowtown	*	18	10
Snowtown Women's	*	5	2
South Kilkerran	*	2	6
Springton	*	4	1
Stanley Flat	*	16	20
Stockport	*	—	—
Strathalbyn	*	11	8
Sutherlands	*	—	—
Tantanoola	997	7	4
Tantanoola Women's	*	4	1
Taplan	*	3	7
Taplan Women's	*	—	—
Taragoro	*	5	2
Tarlee	*	—	—
Tatiara	*	—	—
Truro	*	16	20
Tweedvale	992	19	16
Tweedvale Women's	*	16	20
Ungarra	*	—	—
Upper Wakefield	*	—	—
Wallala	*	11	8
Wandearah	*	3	7
Warcowie	*	3	7
Warcowie Women's	998	—	—
Warramboo	*	3	7
Warramboo Women's	*	—	—
Wasleys	*	12	9
Wasleys Women's	*	5	2
Watervale	*	16	20
Weavers	997	9	18
Wepowie	*	2	6
Wepowie Women's	*	—	—
Whitwarta	997	16	20
Wilkawatt Women's	*	17	21
Williamstown	997	—	—
Williamstown Women's	*	4	1
Willowie	*	23	27
Wilmington	*	17	21
Wilmington Women's	*	12	9
Wirrabara	*	—	—
Wirrabara Women's	*	19	16
Wirrilla	*	5	2
Wirrilla Women's	*	5	2
Wolseley	*	14	11
Wudinna	*	—	—
Yadnarie	*	3	7
Yandiah	*	13	10
Yeelanna	*	4	1
Younghusband	*	—	—
Yundi	998	—	—
Yurgo	*	—	—
Yurgo Women's	*	—	—

* No report received during the month of January. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

DAIRYING.

Dairying as a Sideline on the Farm.

"Our Dairy Cows" was the subject of a paper read by Mr. R. Woodrup at the October meeting of the Pygery Branch. Dairying as a sideline to farming operations in this district, he said, was receiving considerably more attention than it did formerly. The cows should be chosen for their capacity as producers, then by the use of specially selected sires the standard of the herd could be raised. The treatment of the cows on the general wheat farm left much to be desired, and indiscriminate mating was a fault that should be corrected. High producing cows required plenty of good feed, a constant supply of fresh water, and adequate shelter in summer and winter. As summer approached and feed and pastures dried off the ration should be supplemented with some form of concentrates. Linseed meal and bran was a good addition to the hay chaff. Heifers should not be mated until 18 months old. At calving the calf should be left with the mother until it had taken the first milk from the cow. Feed the calf with a little new milk three times each day for a week, then twice a day until three weeks old, when separated milk can be added in increasing quantities until all separated milk is being fed. Care and patience must be exercised in breaking in the heifer, and on no account should the animal be illtreated. Small cowyards are a never ending source of trouble, because cows that are timid have not sufficient space in which to get out of the way of the more "bossy" animals, and this not infrequently results in injuries to the udder. Keep all dairy produce as clean as possible and free from contamination by flies. Separate immediately after milking, and if the cream has to be held for some days—as is the case in so many country districts of this State—it should be kept in an earthenware vessel in the coolest place on the farm. The writer also gave useful hints in the treatment of various ailments of dairy cows. The opinions expressed in the paper met with the approval of members who took part in the discussion, the consensus of opinion being that now that a market was available on Eyre's Peninsula for dairy produce, farmers would be well advised to give more attention to dairying as a sideline.

Coonalpyn Branch.

With the good attendance of 25 members and eight visitors at the November meeting it is evident that interest is being maintained in the Agricultural Bureau at Coonalpyn.

At this meeting Mr. F. Smedley chose as the subject of his paper, "Cows as a Sideline on the Farm." He expressed the opinion that dairying was one of the profitable sidelines for the wheatgrower. So far as their district was concerned, he believed that cows—and, as a natural consequence, pigs and poultry—would add very considerably to the revenue-earning power of the holding. The building up of the dairy herd would naturally depend on the finances of the farmer. Good cows were, of course, necessary, but the services of a bull with ancestors of proven productivity were essential. If top prices were to be realised for the products of the dairy, then strict attention to thorough cleanliness of all equipment was most important. Concluding, Mr. Smedley said that after 30 years' experience in the handling of dairy produce, he was convinced that the success of dairying depended absolutely on keeping a good class of cow, giving her every attention, and keeping everything connected with the industry clean. (Secretary, C. C. George.)

HORTICULTURAL OPERATIONS.

ESTABLISHING A VINEYARD.

At the January meeting of the Light's Pass Branch, which was attended by 14 members and visitors, Mr. P. Mader read a paper on the above subject. "Select and root your own cuttings, because if they are purchased from the nursery the varieties are often mixed. The cuttings should be about 16in. to 18in. long, and prepare the planting trench—which should be 2ft. wide and 2ft. deep—with a spade in preference to the plough. Fill in the trench with 1ft. of earth, then set the cuttings in position, leaving one bud above ground level, and press the soil with the foot very tightly around the cutting. Plant the cuttings in August in order that the land will be well soaked before the end of the winter rains. If the soil becomes dry, give an occasional good soaking with water. Prepare the site on which it is intended to make the vineyard some time ahead of planting so that weed growth will be reduced to a minimum. In marking out the block, a wire is preferred to string, because the former does not get blown about with the wind. Keep the top soil from the holes separate from the subsoil, so that when planting the cuttings the surface soil can be placed around the roots of the cuttings. The holes should be 1ft. square by 18in. deep. Prune the cuttings back to two buds, removing as well all the top roots, leave the others about 4in. long.

THE PLOUGH.

Mr. E. G. Lehrmann said ploughing was one of the most important operations in the cultivation of a vineyard or orchard. It is estimated that the cutting of a furrow with a sharp share requires about 60 per cent. of the total draught of a plough. If the draught of an ordinary double furrow plough is reckoned to be two tons. then cutting the furrows will account for about 25cwts. Experiments have shown that a blunt share may increase the latter by a further 40 per cent., which would mean a further increase of half a ton. The turning of the furrows with a short mouldboard in land of a sandy loam is estimated at 12 per cent. of the draught, but this may be increased by long mouldboards in sticky soil conditions. Knife coulters should always slant well forward, otherwise they catch the weeds and increase draught. Anything that can be done to shorten the distance between the horses' shoulders and the last mouldboard will very considerably lessen the draught. It is a mistake to work horses with chains that are too long, for this represents a great loss of power. Lightness of draught in a plough, however, is not the only point to be borne in mind. If the property consists of heavy soil, it may be necessary to give consideration to an implement that will go into hard ground. Keep all shares tight. Socket shares are much to be preferred to the plate type in stiff soils. Short mouldboards, whilst being light in draught, do not make a good job in heavy soil, because they leave the ground too hollow. Long or medium length mouldboards with deep set coulters should be used in sand; they leave ridged furrows which materially assist in checking drift." (Secretary, C. Verrall.)

MODERN METHODS IN THE DAIRY.

Mr. V. Gurr read the following paper at a meeting of the Tweedvale Branch held on 19th September, 1935. "In times of low butterfat prices the management of the herd calls for a good deal of attention if one is to receive the best results with as little expense as possible. The bull is half the herd, and no keen dairyman should be without a pure-bred bull. Bulls of any breed can be purchased under the Government subsidy scheme, providing they are from tested stock. A bull at all times should be treated with suspicion; he should be kept in a yard where he has plenty of exercise. He should also be well fed. The reason why a bull should be yarded is that the service to each cow can be regulated, which in a large herd with a young bull means a great deal to the life of that bull. A bull should not be allowed to serve each cow more than twice. I advocate a pure-bred bull of high producing stock of whatever breed a dairyman fancies, because such an animal costs no more to feed than a scrub bull, and he will also improve the butterfat standard of the herd. As regards the cows, herd testing and good feeding are the only sound and economic ways to carry on dairying successfully.

Feed in bails, because the feed can be rationed out economically according to the production of each cow. Dairymen cannot afford to feed a cow giving between 100lbs. and 200lbs. of fat a year with the same ration as a cow giving between 400lbs. and 500lbs. of fat. A cow should have six to eight weeks spell and always be fed during that time. It gives her a chance to feed the unborn calf and also to build up her system. Dispose of all culls or low producers. Do not sell them as soon as dry, but keep them for a little while if they are sound (if possible) until they put on a little more condition, and sell them with calf at foot. Avoid buying from the sale ring; there are some good clean cows sold that way, but there is always the chance of introducing disease into a herd. A calf should receive the colostrum (the first milk from its mother) for the first week. It should then be fed on whole milk—1gall. per day—for about a fortnight, and then gradually given skim milk. Do not over feed; it leads to scours. Because of the low price of butterfat, this method is preferable to the buying of other foods. Calves should be kept on milk until four months old. A little clover hay should be available for them to chew as soon as they will eat. Regularity should be practised in dairying, both in milking and feeding. (Secretary, B. Schapel.)

FODDER CONSERVATION.

Mr. A. C. McMillan read the following paper at a meeting of the Mount Gambier Branch held on 6th September:—Fodder conservation is a matter of greatest importance to future development, which will in the next half century increasingly veer towards the adoption of methods of feeding at present only to be seen on rare occasions, and to the provision and conservation of food as a regular and routine practice. The days of easy pastoral conditions have departed. Internal parasites have changed that, and it is now imperative that stock should be kept in health, in order to have the strength to resist the various troubles which have come in the train of settlement. There is no need to associate the term "fodder conservation" with the idea of drought. If that be so, the question of conservation of fodder will be set back a century. The psychological atmosphere in which this question has been wrapped up of late years has definitely retarded its progress. It has been known for many years that the value of food enables sheep to withstand internal parasites, and many associated deficiency diseases can be overcome by judicious management in feeding. Fodder conservation is of vital necessity for the well being of this district. In the early days when stock were running on virgin country they did well, but with the advance of closer settlement we find numerous ailments, due to the fact that we are getting away from Nature's balance. The question of expense need not deter anyone, because there are many methods advanced to-day whereby the only cost entailed is the getting and carting. The actual experience gained by those who have adopted fodder conservation shows that the bogey of expense very often scares the would-be conserver, whereas in actual practice it is nil. Another retarding influence has been the undue stressing of silage.

To many men the term "fodder conservation" means silage and nothing else. Valuable though silage is, it is far from being the only form in which food reserves can be built up. A great deal depends on the purpose for which the fodder is used. Fodder conservation bears much the same relation to livestock as a fire insurance policy on a homestead, with this added advantage that the fodder, if stored under certain conditions, has a sale value as well. One of the best methods of preventing periodic setbacks to stock is recognising the value of fodder conservation as a means of insuring better grown and more productive and healthy stock. It has always been a strong point with stud breeders that young growing animals must not suffer a setback. The owner insures this by having at hand a constant supply of feed in addition to grazing, and varying the amount used in accordance with the quality and amount of grazing. The ill effects of periodic setbacks, to which Australian livestock are subjected, is not sufficiently recognised, nor has the value of avoiding setbacks been properly understood in the production of beef and high quality fat lambs. It is quite impossible to ensure a continuity of nourishing food in this country without conserving fodder, or laying down improved pastures and manuring them heavily.

The latter process is really, in a way, a form of fodder conservation, but it is not universal in its possible application. How is it possible to expect dairy cows to yield highly and bear a vigorous calf regularly, in face of the semi-starvation to which so many of them are subjected almost every year, and that too often in the late winter and early spring just before coming into full milk? No poultry farmer would expect his fowls to go on laying or to fatten without food. The poultry farmer has probably, more than any other owner of stock, recognised the necessity of a constant supply of nutritious food in balanced form. Viewing the question from another aspect one sees that the resisting power of livestock as expressed in the capacity to thrive in face of infection, is to a large extent governed by food. Care must be taken, however, not to push this theory too far. Thus, there is no evidence that feed influences the susceptibility of cattle to contagious abortion, pleuro-pneumonia, or mastitis, but there is very definite evidence that feed influences the resistant power of sheep to the ordinary stomach and intestinal worms and their harmful effects. Further, the absence of certain required constituents from the food will quite certainly tend to bring about such abnormal conditions as sterility in one of its many forms, osteomalacia, rickets, grass tetany and milk fever. Moreover, it is clear that much of what is called preparturient apoplexy in sheep is due to food deficiency, and entero-toxaemia to an excess of food in certain directions, an excess which could be balanced by stored food of the right type. Much of the botulism which occurs could be prevented by the judicious use of stored fodder. These examples are probably sufficient to indicate the importance of a study of this subject. (Secretary, N. R. Aslin.)

ESTIMATING HAY YIELDS.

Paper read by Mr. C. J. Whillas at a meeting of Green Patch Branch held on 5th December:—When hay cutting most farmers wish to know the yield, and it is usual to estimate same from the weight of binder twine used. This is quite all right provided proper judgment is used, but it can be very misleading, for twine under some conditions will tie fully twice as much as under others. The factors that regulate the ratio of twine to hay weights are as follows:—

(*a*) Circumference of sheaf at the tie, *i.e.*, the size of the sheaf.
(*b*) The length of twine taken for knot and waste cut.
(*c*) The quality of the twine.
(*d*) The tightness of the tying, *i.e.*, the tension on the twine and the compression on the trip.
(*e*) The height of the crop.
(*f*) The density of the hay.

Of the above, the circumference of the sheaf is the main factor, for the reason that the contents and therefore the weight of a sheaf vary as the square of the circumference. For example, take a binder in a given crop; set it to throw out a 12in. circumference sheaf. The knot and waste cut will take up, say, 5in. twine. Then alter the machine to tie a 24in. circumference sheaf. The latter sheaf will weigh four times the former, using 29in of twine as against 17in. The variation in twine weight to hay weight ratio will therefore be 68 to 29, or in other words, the twine with the big sheaf will go more than twice as far as with the small. It is not suggested that a binder can be altered to the extent mentioned above, but years ago I tried out this matter on a new machine and was definitely able to prove that approximately a two to one difference could be made in twine used per ton of hay cut by altering the size of the sheaf. The twine used in the knot and the waste cut varies a little according to the make and the condition of the binder. It is obvious that the quality of the twine will make a difference in the twine-hay-weights ratio, because the dearer twine has greater length per pound. It is also obvious that a tight, compact sheaf will give a lower ratio of twine weight to hay weight than will a loose sheaf.

As to height of crop, one would not expect twine to go so far per ton of hay in a 2ft. high crop as in a 5ft. high crop; though the difference is not so great as one would expect, certainly not 5 to 2, for the reason that with the short crops the result is a very untidy sheaf with quite a proportion of the hay not caught within the band.

As regards hay density, there is considerable variation in the weights of hay per cubic yard from different crops, and this, of course, influences the ratio of twine weights to hay weights. It can be seen therefore that it is necessary to use a good deal of judgment in estimating hay weight from twine used. Speaking from 30 years' experience, during which I have always checked up my hay weights and twine used weight in every possible way, I have found, using medium quality twine, *i.e.*, 475ft. per pound twine, on average oaten hay crop and cutting a 7lb. to 8lb. sheaf results in approximately 60 tons of hay per cwt. of twine used. For the last few years crops have been heavier and results have been 70 tons and over per cwt. of medium quality twine used, the sheaves averaging a bit over 10lbs.

The following method I have used for years to arrive at the correct twine-hay weights ratio:—When cutting under average conditions for the season's cut, have someone count the number of sheaves turned out per ball. Do this for several balls, in order to obtain a correct average. Then when the sheaves are dried out weigh enough to give a good average of their weight. It is then an easy matter to calculate the total hay yield from the twine used. To arrive at the hay yield per acre when cutting, count the sheaves turned out from several one-chain lengths of travel with a 6ft. binder, thus getting the average weight of hay produced from 1 chain by 6ft. This, in pounds, is approximately cwts per acre hay yield. Also check up twine-hay weights ratio later when chaffing by weighing the chaff cut, carefully weighing ties taken out, and allowing a percentage for the waste cut of the twine.

After the hay is carted and stacked, if the tonnage of the stacks is calculated from the formula used by the insurance companies, a further check can be made on the total yield. The tonnage thus given works out fairly accurately with actual chaff cut for sale. (Secretary, C. J. Whillas.)

CROPS FOR EARLY FEED.

One of the young members of the Baroota Branch, Mr. C. R. Mudge, read the following paper at the November meeting which was attended by 15 members and visitors. Oats and Cape Barley, he said, were the best cereals to sow for early greenfeed in the Baroota district. Cape Barley should not be sown in paddocks which it was intended to put under wheat. The better plan was to drill it in small paddocks. For 10 years he had sown barley on the same paddock and the yields were just as good to-day as they were when the land was first sown to this cereal. The crop should be kept well eaten down; if allowed to grow too rank and then grazed off it did not make a good recovery. Oats sown on land that would be fallowed the next year was a good way of handling that cereal, especially on sandy land. By sowing oats on such land in early March or April, the growth of weeds was checked and the land need not be fallowed so early which, as a consequence, reduced the period over which there was a danger of drift. This season (1935) wheat sown on land on which oats had been grown the previous year and fallowed gave better returns than early fallow. Of the varieties of oats with which he had had experience, Early Burt had proved good for early feed, but the crop became thinner each time it was eaten back. Lachlan was a better stooling variety when fed down, but it was rather difficult to sow because of the awns. It did not yield so well as the former variety and was more inclined to shake. (Secretary, E. Hulster, Port Germein.)

HOMESTEAD MEETING.

The September meeting of the Jamestown Branch was held at the homestead of Mr. W. E. Symonds. Among the questions from the Question Box which were answered were the following:—*Question*—Does it pay to top-dress grassland, with wool at 1s. per pound? *Reply*—With super at its present price it is a payable proposition, but any increase in the price of super combined with dry years or with a fall in the price of wool would make it unprofitable. *Question*—When is the best time for mares to foal? *Reply*—Most suitable period in the Belalie district is from the middle of August to the middle of September, thus allowing for heavy work to be completed without depleting the team. The foal would have the benefit of spring weather and the mare more time to recover before spring cultivating. *Question*—Which is the best time and method of sowing lucerne seed? *Reply*—Early autumn or early spring is generally most suitable. For dry districts early September is recommended, because frosts do not then damage young plants and growth is assisted by spring weather. September sowings are also less liable to damage by lucerne flea. The soil should be well worked and freed from weeds and sowing done by drill or combine. *Question*—Which is the best type of dairy cow for the district, and why? *Reply*—The Milking Shorthorn was favoured because the milk was richer in butterfat; it was a robust type of cow, with a higher production for quantity of feed than other breeds. (Secretary, R. B. Phillips.)

SUGGESTED ALTERATIONS AND IMPROVEMENTS ON FARMING METHODS, TO MEET THE TIMES.

Paper read at a meeting of the Hartley Branch held on 11th September:—Owing to the fluctuation of the various markets for farm products, the "average" man on the land to-day must in many ways change his methods and the various activities on his holding if he is to keep "holding" on and make his occupation sustain him and his family in reasonably comfortable circumstances. The question is, of course, State-wide, but the following suggestions would apply particularly to this locality. (It is not suggested that the changes can be all made in one year.)

The day of wheat farming as a major source of income appears to be temporarily over, and the landholder must seek other avenues for his revenue, so that the producer must become proficient in mixed farming. This would not present a very difficult problem, owing to the fact that for a number of years he has been carrying on the so-called "sidelines" of the farm. These should form the nucleus of the modern farm. On the normal, or average holding it is surprising what can be accomplished in this direction. However, it cannot be done without a general reorganisation of present conditions and hours of labour. Assuming that the main source of revenue is from the wheat crop, areas used for the production of grain can be reduced to bare necessities. The introduction of pasture grasses, which are known to grow abundantly in the locality, must be fostered. The land will grow good fodder with proper care and cultivation.

LIVESTOCK.

Invest in a small flock of sheep; some type that will produce wool and mutton, and meet the demands of the local markets. If uncertain of the type of sheep to commence with, obtain the advice of a local pastoralist, who in most cases is willing to give advice. Almost to exhaustion the cow has been called upon to supply the ready cash to carry on, and on most farms cows are found in numbers that make one wonder how they find sufficient food to exist. In the suggested "reorganisation" the herd could be cut down to a few cows of some reliable and productive strain. Have them tested, and if one is not paying for its rations, replace it with one that will. Breeding for milk or cream production, or, in the instance where the run is sufficiently large, to pasture a few steers for baby beef and the raising of calves should form part of the "reorganisation" scheme.

Horses, which the man on the land can ill afford to do without, should be of a type suitable for the jobs on the farm. For reasons, often sentimental, many old horses, who have outlived their usefulness, are kept on the farm to die, eating grass that would keep a good cow or a sheep or two. These "old stagers," hard as it may seem, should be relieved by a kindly bullet rather than kept in the paddock until, as is often the case, one of the team breaks down, and it is then called upon to take up its place again in the traces and be given a task at which it has served its time, being utterly unfit for the sudden change. A good brood mare or two should be kept to produce the horse which will be needed to replace those at present in commission when they become too old.

No farm is complete without its quota of pigs of the type sought and required by present buyers. Again, I stress the necessity of starting with type pigs. Pigs that are bred on the lines required command higher prices in the markets. Portion of the land should be set aside for a suitable run and pens constructed that will be suitable for correct housing. A good pig deserves a good, clean house, and a good mother should hold pride of place in the pen. The selection of suitable males to produce the desired type should also be given earnest consideration.

Again, no farm is complete without its stock of poultry. Perhaps a few turkeys, geese, and ducks to meet own and local requirements could be kept. But with fowls, the barndoor fowl of the nondescript type should give place to a good laying strain; if eggs are required, those that are known to be producers of good-sized marketable eggs. Buy the originals from a breeder who is known by repute to have the stock that produces the maximum of eggs in the laying period. The vital point, once the flock is established, is to cull out the poor ones, and cull rigidly. Once a hen has served her term as an egg producing machine, she should be consigned to the pot or to the poultry market.

HOUSING AND FEEDING.

Housing is of utmost importance and should be carefully considered before commencing. Feeding on correct lines—as with all other animals—should be strictly adhered to to get the best returns from one's birds.

Close to any homestead and near the water supply one usually finds soil suitable for a small garden, and a little judicious selection of vegetables known to grow satisfactorily should be made, and will supply the needs for kitchen use. The surplus, if any, will be readily consumed by fowls or pigs.

OUTBUILDINGS.

The outbuildings on any farm should be of such type suitable for its specific purpose, and in all cases should be erected in a tidy, workmanlike manner, and in a position most suitable to the management of its particular occupants. Implement sheds, horse stable, cowsheds, fowlhouse, and pig pens should be kept as tidy and clean as is possible, and not allowed to become delapidated.

One point that must not be overlooked is the water supply to the various yards and pens. Water plays a vital part in the life of all creatures, and its easy access by stock will materially benefit the health of the animals.

THE WORKERS.

The farmer usually has some growing boys, and they should be encouraged (even if only of school-going age) to take an interest in the particular units of the farm; one could look to the sheep, one the poultry, the cattle, &c. Give them the choice of their charges; allow them to show in the local show if possible. Endeavour to get them to keep a record of each line. Books should be kept recording the details of each, in expenditure and income. Discuss problems with them when all are together. Give advice and take it. Do not expect the lads to do the correct thing always. Give them a chance to follow their own ideas and initiative. They may have some latent talent that will be of considerable value, and they may make mistakes that will eventually assist them in later life. If the returns of the farm are insufficient to pay wages, see that the lads get "some" pocketmoney by way of a bonus, or the sale of portion of the marketable products. It is an incentive to work and fosters the habit of thrift. Nothing breaks a lad's heart more than to think his neighbour or his pals are getting a few "bob" to spend while he is obliged to toil away without any remuneration whatever, and he soon begins to become dissatisfied with the life—hence the drift citywards, with its consequent result that the farmer is obliged to employ outside labour.

HOME LIFE.

Home life should be attractive. Wireless or music of some kind should be available, also a good stock of reading material for leisure time should be at hand. Books of reference, dealing with farming problems, economic questions, and general literature should form portion of the library. The subscription to some agricultural papers should receive consideration, while a daily or weekly newspaper is indispensable. (Secretary, W. J. Brook.)

FATTENING POULTRY FOR MARKET.

The October meeting of the Cherry Gardens Branch was held at the homestead of Mr. J. C. Blakely. Mr. I. L. Stone read the following paper:—In deciding upon the breed of bird one would naturally select a heavy breed—Rhode Island Red, Black

Orpington, Indian Game, Light Sussex, or Barnevelders—birds that will grow quickly, because success or failure depends on the length of time before the birds are ready for market. Any of the above-mentioned birds are good, but crossbreds grow more quickly and are stronger and more healthy. At the present time we are carrying out experiments in this direction. It is necessary to have a continuous supply of prime birds ready for killing. Thirty-six hours after the chicks are first hatched feed them in the ordinary way with a well-balanced ration. This season excellent results were obtained from the following mixture for the first five to six weeks:—10lbs. bran, 8lbs. pollard, 5lbs. meat meal, 2½lbs. buttermilk flake, 16lbs. maize meal, 7lbs. wheat meal, and ½lb. common salt. Thoroughly mix and feed dry, with plenty of good, clean water always available. Once the chicks have received a good start many of the troubles are over, because good healthy stock rarely take disease, while poor, under-nourished stock are a continual source of worry. Should the birds have done well at from four to five months of age they should be ready to be topped off. This is done by putting them in closely confined quarters with a wirenetting floor, so that the birds cannot scratch. The object has been to grow a large, healthy frame, and now it has to put on flesh. Feed the birds on pollard and water only, mixed to a thick soup. With no exercise it is surprising how readily the birds put on weight. Up to the time of putting the birds in the fattening pen they will have cost from 1s. 8d. to 1s. 9d. per head, and with pollard at 1s. per bushel three birds can be fattened for 4d. per week. Three to four weeks in the fattening pen should be sufficient to finish off the birds to dress about 4lbs. in weight, which is about the weight required by most purchasers. (Secretary, A. B. Stone.)

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		SOUTH-EASTERN DISTRICT.		
Tantanoola	7/12/35	9	Discussion—Bush Fire Control	L. J. C. Osborne
Tantanoola	4/1/36	12	Address—A. L. Warren	L. J. C. Osborne
		UPPER NORTH DISTRICT.		
Baroota	13/1/36	12	Discussion—Identification of Plants	E. W. Hulster
		LOWER NORTH DISTRICT.		
Light's Pass	6/1/36	14	Papers—P. Mader, E. G. Lehrmann, and Fred Boehm. "Drying Apricots"—J. Baum	C. A. Verrall
Penwortham	30/10/35	11	"Oat Experiments"—Watson Coleman	A. R. Jenner
Penwortham	25/11/35	10	Address—J. O. Hatter	A. R. Jenner
Whitwarta	20/1/36	24	"Review of Past Season"—B. Moldenhauer	C. W. Dunow
Black Springs	14/1/36	9	Harvest Results	K. H. Dunn
Williamstown	24/1/36	6	Address—J. B. Harris	W. R. Parmenter
		YORKE PENINSULA DISTRICT.		
Kilkerran	14/10/35	11	"Value of Oat Crop"—E. Heinrich	A. Sawade
Weavers	13/1/36	11	Harvest Reports	H. W. Cornish
		WESTERN DISTRICT.		
Roberts and Verran	6/11/35	10	"Vermin Destruction"—I. C. Cowley	C. M. Masters
Kyancutta	5/11/35	12	Wudinna Conference Report	E. A. Kelly
Butler	20/1/36	12	Formal Business	C. F. Jericho
Laura Bay	14/1/36	10	"Fat Lamb Raising"—A. J. Bowell	P. S. Morrison
Koppio	8/1/36	9	Discussion	M. T. Gardner
Laura Bay	10/12/35	15	Paper—A. J. Bowell	P. S. Morrison

OTHER REPORTS RECEIVED.—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			SOUTH AND HILLS DISTRICT.	
Longwood......	7/12/35	13	Homestead Meeting at Mr. Angus Cameron's	H. G. Haines
Cherry Gardens	4/1/36	12	Homestead Meeting at Mr. K. Jacobs'	A. R. Stone
Ironbank	8/1/36	18	Address—H. H. Orchard	C. M. Morgan
Blackheath	9/1/36	8	Paper from *Journal*	E. H. Paech
Hope Forest ...	6/1/36	8	"Potatoes"—M. Jacobs	H. J. Hunter
Longwood......	11/1/36	18	Homestead Meeting at Mr. J. Roebuck's	H. G. Haines
Yundi	19/12/35	—	Field Day at A. B. Cocks' property	T. R. Smart
Yundi	15/1/36	—	"Fruitgrowing"—Mr. Ward	T. R. Smart
Mount Compass	9/1/36	20	Question Box	C. E. Verco
Monarto South .	18/1/36	13	Weighing Wheat Samples	C. F. Altmann

WOMEN'S BRANCHES.

DISPLAY OF HANDICRAFTS.

In common with quite a number of other Women's Branches, members of the Warcowie Branch this year staged their first exhibition of women's handicrafts. At their meeting held on 23rd November there was an attendance of 19, including visitors from Jamestown and Hawker. Mrs. E. L. Orchard, of the Belalie Branch, opened the exhibition and Mrs. Bailey acted as judge. Amongst the articles included in the exhibition were knitted garments, coat hangers, quilts, afternoon tea tray, d'oyleys, handbags, dolls, preserved fruits, floor mop and polish, hooked rugs, needlework, crocheting, and recovered chair seats. Members were sincerely congratulated on the successful show that had been staged and were urged by the visitors to make the exhibition an annual event on the Branch's programme. (Secretary, Miss A. G. Avery.)

KARTE.

November 11th.—Attendance: 26.

The November meeting was held at the residence of Mrs. D. Flavel. After inspecting the home and garden, Mrs. Flavel read a paper "Rug Making," and exhibited samples of her handicraft. Members of the Men's Branch also attended, and were shown the crops and farm by Mr. Flavel. It was decided to hold a Bureau Exhibition on April 15th. (Secretary, Mrs. F. Atze.)

SOAP MAKING.

The Myponga Branch is one of the most recently formed Women's Branches, and at their meeting held on 16th January Mrs. R. Magor, in giving the following recipe for soap making, said she had found that the soap which she made in her home was quite equal to the manufactured article. Any fat or suet that is rancid can be rendered down and saved for the purpose. *Recipe.*—1lb. each resin and caustic soda, 6½lbs. fat (which must be free from salt), 1 tablespoon turpentine, ¼lb. borax, 1 cup each kerosene and cloudy ammonia, and finally 2galls. of rain water added when the soap is nearly done. Put on all ingredients to boil, except ammonia and soda, which should be added last. Boil until the mixture is as thick as porridge, usually about 2 hours. Stir constantly, and if it shows signs of boiling over, add ½ a cup of cold water.

PRESERVING FRUIT.

Mrs. Magor also gave the following hints for preserving fruit. Cook the fruit carefully and strain the syrup through a muslin cloth to make it clear: a light syrup for pears and peaches and a heavier one for apricots and quinces. To make the light syrup use 1 cup of sugar to 3 cups of water, and for the heavier, 1 cup of sugar to 1½ cups of water. Temperatures and times of cooking: Apricots, 180 deg. for ½ hour; apples, 180 deg. for 2 hours; pears, 180 deg. for 2½ hours; peaches and plums, 160 deg. for 2½ hours. (Secretary, Mrs. M. Bounds.)

GEORGETOWN.

December 12th.

Twenty-four members attended the December meeting of the recently formed Women's Branch at Georgetown, when an excellent paper "The Management of the Kitchen" was contributed by Mrs. G. Smallacombe. With the consent of the writer this paper will be included on the Agenda of the Mid-North Conference which will be held at Beetaloo Valley on 12th March. (Secretary, Miss J. Crawford.)

CAKE DECORATING.

Cake decorating was the subject of a paper read by Mrs. W. McKendrick at the December meeting of the Clare Branch, which was attended by 33 members and 6 visitors. The paper read as follows:—Roll all icing sugar and sift. Before commencing to ice the cake take a piece of 3-ply wood, cover with a paper d'oyley or paper, cut the top of the cake level, and turn the cake upside down on to the board. Brush over the cake surface with a little white of egg, or flour may also be used for this purpose. Cover the cake with almond or mock almond icing. *Recipe.*—1 egg yolk well beaten and 1 tablespoon melted butter, 1 tablespoon lemon juice, ½lb icing sugar, ½ cup coconut. If too stiff, add a little more egg yolk. Never add water or milk. Knead as for pastry dough on a board sprinkled with castor sugar, and then roll out and place on cake. *Almond Paste.*—1lb. icing sugar, 3lbs. ground almonds, 2 egg yolks, ½ tspn. essence. Orange or lemon juice may be used in place of essence. Sift sugar, add almond meal, and mix to a stiff paste with the liquid ingredients. The paste must be suitable for rolling; if it is too soft add more sugar; if too stiff, add a little more egg yolk. Knead as for a pastry dough on a board sprinkled with castor sugar, then roll and place on cake. When the icing is almost dry, give 2 coats of royal icing. *Royal Icing.*—1lb. icing sugar, 2 egg whites, a few drops of essence, 1 tspn. glycerine, and a drop or two from a clean blue bag of blue. To mix the royal icing, sift the sugar into a roomy bowl; keeping a spoonful or two in case the icing is too moist when mixed. Add all other ingredients; the whites of eggs should be slightly broken, but not whipped to a stiff froth. At this stage the icing should be stiff and very difficult to stir. Do not add more egg white, but beat the mixture vigorously with a wooden spoon or spatula for at least 10 minutes until it gradually becomes whiter, softer, and easier to handle. When the correct stage has been reached the spoon will stand upright in the mixture. The royal icing must be put on evenly, and each coat allowed to dry. The smooth shining appearance is obtained by dipping the knife into a deep jug of boiling water, shake the knife free from moisture, and smooth it carefully over the icing. The knife must be fairly broad, thin, and pliable. Repeat this practice until the cook is satisfied with the result. To glaze: add enough egg white to the royal icing so that it will allow it to flow evenly over the knife. Do not smooth with the knife. When not in use cover the basin of icing with a cloth.

Mixtures.—Egg yolk makes yellow icing; blue bag, blue; cochineal, pink; blue and pink, mauve; blue and yellow, green; red and yellow, orange; cocoa or chocolate, brown; pink and a few drops of coffee essence, brick shade. *Decorations.*—The modern metal icing pump makes the work very simple, and with a little practice all manner of letterings and patterns can be worked on the cake. To trace a design on a cake, obtain a copy of the required illustration and draw or trace it on to ordinary white paper. Then lay the paper on the hardened surface of the iced cake, and with a needle prick the design on to the icing so that the line of dots can be followed with the thread from the icing pump. *Coconut Frosting.*—1½lbs. sugar, ½ pint milk, ½lb. coconut, and a piece of butter the size of a walnut. Boil sugar, milk, and butter for 7 minutes, place in a bowl, and stir until it cools. Add half of the coconut, and stir until it thickens. Spread on the cake, and sprinkle the top with the remainder of the coconut. (Secretary, Mrs. McKendrick.)

THE WOMEN'S BUREAU.

Reading a paper on "The Women's Bureau" at the January meeting of the Monarto South Branch, the Secretary, Mrs. F. Liebelt, said it was only of comparatively recent years that organisations solely for the benefit of rural women had been instituted in Australia. Women in the country were not expected to have any interests outside that of home life. Gradually, however, the country woman had extended her activities beyond that sphere, and at the present time there was possibly no other organisation that provided better scope for her desire to be of assistance to her fellow women than the Agricultural Bureau. Women's Branches of the Agricultural Bureau were non-political and non-sectarian; they provided the opportunity for members to meet each month and exchange opinions on every aspect of domestic economy, and in scattered districts where facilities for social intercourse were almost non-existent, the Branches were the means of bringing the women folk together and making a break in the monotony of their daily lives.

The speaker paid a very high tribute to the value of the Annual Congress, where delegates from Branches all over the State met in conference to talk over subjects of interest to all rural women. Any woman from the country who was in Adelaide during the holding of the Congress should not miss the opportunity of attending at least one of the sessions.

The reading of papers by individual members was one of the chief educational features of the Bureau, and if members took an active part in the discussion that followed, the value of the papers would be considerably increased.

The regular attendance of members at all meetings and the offering of suggestions to maintain interest in the Branch would encourage other members to take an active part in the affairs of the Branch.

In the last few years Women's Branches had devoted much of their energies to the organisation of competitive exhibitions of women's handicrafts. These fixtures were becoming increasingly popular, and were well worth a place on the programme of every Branch.

Still another good suggestion was for members when reading papers on suitable subjects to supplement their remarks with a practical demonstration. Where Branches were reasonably close together, inter-Branch visits could be arranged with advantage to all.

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		WOMEN'S BRANCHES.		
Coonawarra	18/12/35	31	"Cake Decorating"—Mrs. W. L. Redman; paper by Mrs. Soper	Miss O. A. Lear
Kybybolite	10/12/35	23	Knitted Sock Competition	Mrs. W. D. Kekwick
Kybybolite	7/1/36	28	Fruit Cake Competition .	Mrs. W. D. Kekwick
Karte	13/11/35	25	Homestead Meeting. "Rug Making," Mrs. Flavel	Mrs. F. N. Atze
Clare	4/1/36	25	"Good Reading"—Mrs. A. Telfer	Mrs. A. C. Pollock
Georgetown	10/12/35	24	"How to Run a Kitchen" —Mrs. G. Smallacombe	Miss. J. E. Crawford
Laura Bay	14/1/36	9	"Biscuits"—Miss R. Blumson	Miss T. E. Barnett
Balhannah	15/1/36	18	Extracts from *Home Journals*	Mrs. D. Camp
Myponga.......	16/1/36	5	"Soap" and "Preserves" Mrs. K. Magor	Mrs. M. Bounds
Monarto South .	18/1/36	13	"The Women's Bureau" —Mrs. H. B. White	Mrs. F. W. Liebelt
Morchard	22/1/36	15	Discussion	Miss A. F. Brown

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All communications to be addressed:

'The Editor, Journal of Agriculture, Education Building, Adelaide.''

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, 1936.

South-East (Upper), at Bordertown, Wednesday, 1st April (Mr. L. H. Butler, Secretary).

South-East (Lower), at Kybybolite, Wednesday, 8th April (Mr. A. S. Shepherd, Kybybolite, Secretary).

Dairying, at Strathalbyn, Thursday, 21st May (Mr. Reg. Sissons, Strathalbyn, Secretary).

River Murray, at Block E, Thursday, 18th June (Mr. J. C. K. Brigham, Box 65, Renmark, Secretary).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Lucerne Rust.

Following the receipt of diseased specimens of lucerne plants, forwarded by a subscriber to the *Journal of Agriculture* at Wilmington, Mr. T. T. Colquhoun, M.Sc. (Assistant Plant Pathologist at the Waite Institute) diagnosed the trouble as lucerne rust, and says very little can be done by way of treatment of the crop. Spraying is not practicable, and may even be detrimental to the crop, whilst giving very little protection. In many instances, however, the rust is parasitized by another fungus, and spread of the disease is naturally limited.

If the infection is not too widespread, the cutting, careful removal, and burning of the affected tops may be possible, but results cannot be guaranteed by this treatment, since spores will probably be left on the crowns to re-infect new shoots.

Top watering (sprinkling of the plants) is liable to aggravate the trouble, the wet foliage being favourable for germination of the spores and infection of previously healthy plants.

In Victoria experiments have shown that lucerne grows better under flooding than sprinkling, the foliage apparently preferring a dry atmosphere.

If the rust is widespread, complete renewal of the stand may be advisable. If this action is taken the present crop should be cut, left to dry, and preferably burnt, although it may be used for hay. Following ploughing, it has been found advisable in practice to plant a crop of barley in the succeeding year without any nitrogenous fertiliser, renewing the lucerne in the next season. This is a cultural recommendation, but is also advisable from the point of view of the health of the lucerne. It will also be necessary to examine the headlands for volunteer lucerne plants with the object of eradicating any diseased individuals.

Fire Control Legislation.

Asking for a ruling as to the liability of district councils for actions of fire control officers appointed by them under the Bush Fires Act of 1933, the Clerk of the District Council of Kingscote was advised by the Minister of Agriculture that:—

1. It is obvious that if a fire control officer appointed by a council is not himself liable in damages for any action, then the council cannot be liable.

2. It is considered that, unless a fire control officer acts unreasonably or negligently, or in excess of his powers, no person could claim damages in the event of, say, a firebreak being burnt. This would be the position, even if, through a mistake in judgment, the firebreak proved unnecessary.

3. If, however, a fire control officer did become liable for his actions, it would depend on the fact of the particular case whether the council also was liable. Under section 11 (5) the council may give directions to the officer, and in such a case, if the damage arises as the result of the directions, then, subject to the considerations outlined in paragraph 2, the council would be liable for the damages. If directions are not given, or, if given, the course taken by the fire officer is contrary to the directions, it is possible that in most cases no liability would arise.

4. In most cases, therefore, the chances of a council being held liable in damages are remote, and there is no necessity for amendment of the law.

Irish Blight of the Potato.

Asking if any means of preventing losses to potato crops by the disease locally known as potato wilt, the Secretary of the Clarendon Branch of the Agricultural Bureau has been informed by Mr. A. G. Strickland, M.Agr. (Chief Horticultural Instructor) that "It is presumed that the term 'wilt', as used by the Bureau, refers to 'Irish Blight,' a disease which was more prevalent in potato crops last season than is usual."

The disease is caused by a fungus *Phytophthora infestans*, and its development is favoured by moderate temperatures and high humidity, *i.e.*, muggy and humid weather. In South Australia the normal spring weather is such that Irish Blight does not give much trouble, but in a spring such as was experienced in 1935 the disease naturally makes progress, and occasions damage to crops. Many other fungus diseases (such as black spot of apples) were similarly favoured in the spring of 1935.

Given normal weather conditions next spring, it is not anticipated that Irish Blight will be as troublesome as in 1935, but nevertheless certain precautions are advisable.

In the first place, use only clean seed. The disease may be carried over in seed potatoes, and on this account the use of seed potatoes harvested from plants affected with Irish Blight should be avoided, if possible. If such seed must be used, or if the source of the seed is not known, it is advisable to pickle the seed before planting, *i.e.*, immerse for 1½ hours in a solution of 1lb. formalin in 20galls. of water. Although this treatment cannot kill disease within the tubers, it will effectively deal with disease on the surface of the potatoes, and, moreover, will assist in controlling the disease "common scab."

Having planted seed, the position in regard to Irish Blight depends largely on the type of weather experienced in spring. Even after exercising all precautions as to seed, the disease may turn up if the weather is favourable.

If the spring commences humid, it is wise to apply a Bordeaux or Burgundy mixture spray to the potatoes *before* any signs of the disease are noted. This spray will coat the foliage and prevent infection. If the weather continues wet, additional sprays should be given to maintain a protective coating on the plants. In regard to spraying, it is important to realise that the spray should be applied before the disease appears, or, at any rate, at the very first sign of trouble.

In the event of the weather becoming warm and dry after application of a Bordeaux or Burgundy spray, it will be quite safe to omit spraying, unless further extended periods of damp weather are experienced."

Ban on Matches.

The Minister of Agriculture (Hon. A. P. Blesing, M.L.C.) has caused a proclamation to be issued banning the sale, offering for sale, distribution, and use during the period between 31st October in any year and the 1st day of the following May, of any matches other than those made to strike only on a preparation affixed to the box containing the matches, or to a box containing matches of the same description.

The proclamation was the result of advice received of the manufacture of a certain class of match which was stated to be waterproof and specially treated for striking freely on any rough surface under the worst weather conditions. These matches would strike practically on any surface, such as the sole of a boot or even on portion of a person's clothing. The object of making a ban on this class of match was to minimise the risk of bush fires during the summer months. It was considered that these matches would be dangerous in the hands of children or other irresponsible persons.

Sheep Dips.

Sheep Dips.—The recent conference of Yorke Peninsula branches held at Arthurton made a request that a list of sheep dips, complying with the provisions of the Stock Diseases Act, should be published for the information of members of branches. The Chief Inspector of Stock (Mr. C. A. Loxton) has supplied the following statement:—Any sheep dip which, when mixed according to the directions of the manufacturer, contains not less than one-tenth per cent. of Arsenic estimated as arsenious oxide will comply with the notice published under section 30 of the Stock and Poultry Diseases Act, 1934. The following dips comply with this notice:—Bickford's Sheep Dip Powder, Cooper's Powder Sheep Dip, Cresco Sheep Dip, Dytic Fluid Arsenical Sheep Dip, Edwards' Sheep Dipping Powder, Lan-o-leen Arsenical Sheep Dip, Little's Tripolvos Sheep Dip, Little's Patent Powder Dip, Little's Poisonous Liquid Sheep Dip, Immunol Sheep Dips—Fluid and Powder, Imperial Sheep Dip, Pestkill Sheep Dip, Quibell's Powder Sheep Dip, Royal Sheep Dip, Sickle Powder Sheep Dip, Tic-toc Sheep Dip, Udip, Vacdip, Vallo Sheep Dip, Young's Arsenical Sheep Dip Powder.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publications:—

"International Review of Poultry Science," Volume 8, Nos. 1-2.

"Intense Systems of Apple Culture," Bulletin No. 49. Ministry of Agriculture, England. Price, 1s.

AGRICULTURAL INQUIRIES.

[Replies Supplied by W. J. Spafford, Deputy Director of Agriculture.]

Phalaris Tuberosa.

The Balhannah Agricultural Bureau asks:—"What time of the year should Phalaris tuberosa *seed be sown in the Balhannah district?"*

Reply—In the Balhannah district *Phalaris tuberosa* should be seeded in the autumn—in April, if land is in good germinating condition, but otherwise in May. It is very important that the land should be clean and free from weeds, so that it is advisable to fallow the land, even if for a short period only, before attempting to establish the crop. *Phalaris* seed should not be mixed with other seed in ordinary conditions, and if a mixed pasture is desired, the other plants can be introduced after the *Phalaris* is one or two years of age. If the germination test has shown the *Phalaris* seed to have high germinating power, from 2lbs. to 4lbs. of seed per acre are ample. The seed can be mixed with superphosphate, provided that it is sown not more than 4 hours after mixing. *Phalaris tuberosa* can be cut with a mower or scythe, and is really good green fodder. In strong-growing stands the growth becomes so dense that it is a fairly heavy job cutting it, but it can be done without much trouble in most cases. Provided the hay is not left out in the fields too long after it has been cured as hay, it makes a really good hay, and is quite suitable for feeding to cows after being chaffed. Most of the larger firms of seedsmen carry good *Phalaris tuberosa* seed.

Oats for 16-25in. Rainfall Districts.

The Blackheath Agricultural Bureau asks:—"Which is the best variety of oats to grow for grazing purposes in a district with a rainfall of 16 *to* 25 *inches?"*

Reply—''Mulga'' is a good oat to grow for grazing purposes in a district where the annual rainfall might reach 25in. If it be grown for grazing only, better results would be secured from a mixture of about 30lbs. rye and 40lbs. oats per acre, the rye producing winter feed in greater abundance than will any other cereal, and the oats continuing to grow well into the summer.

Eradicating Couch Grass.

A member of the Monarto South Branch of the Agricultural Bureau reports that small patches of couch grass are appearing on his farm.

Reply—To combat this weed it is suggested that if used persistently and each time as soon as green appears in the patches, a solution of sodium chlorate in water will eventually kill out the couch grass. The solution should be what is known as 10 per cent.; that is to say, 1lb. of sodium chlorate in 1gall. (10lbs.) of water, and should be applied to the grass from a watering can. Best results are obtained after rain, and if the soil is dry, it should be watered before applying the solution. Care should be exercised when using sodium chlorate, as some materials that become dry after having been soaked with the solution become highly inflammable. The material can be purchased from Hardie Trading Pty. Ltd., South Road, Mile End.

Grasses for Lower Yorke Peninsula.

The Secretary of the Weavers Branch of the Agricultural Bureau asks:—''What grasses can be recommended for this district?''

Reply—There is only one true grass that can be recommended for the Weavers district —Wimmera rye grass—but of other grazing fodders, lucerne and King Island Melilot can be grown, and the early subterranean clover is worth a trial. Lucerne should be sown on fallow at the rate of 6lbs. per acre with 2cwts. superphosphate if the stand is required for 5 or 6 years, but if only required for 2 or 3 years, seed at the rate of 4lbs. per acre could be drilled into a stubble with 1cwt. of superphosphate. Depending upon the time when the rain fell, seeding should be done in April or May. Wimmera rye grass can be sown with a cereal that is to be harvested for grain, using 2lbs. of seed per acre. King Island Melilot can be sown with a crop, or broadcasted after mixing with superphosphate, using about 3lbs. or 4lbs. of seed per acre.

[Replies given by Mr. W. J. SPAFFORD (Deputy Director of Agriculture) to questions submitted at the Conference of Yorke Peninsula Branches, at Arthurton, on 4th March.]

Wheat-Sick Land.

''What is the best treatment for land that is wheat-sick?''

Reply—''In climatic conditions such as exist in most of the wheatgrowing districts of South Australia land becomes wheat sick fairly quickly when cereals are the only crops grown, and when the fields are not rested from cropping for sufficiently long periods of time. This wheat-sickness is purely a matter of over-cropping with similar kinds of crops, such as wheat, barley and oats, and in most localities is easily corrected. Where the rainfall is sufficient to permit of the growth of field peas, this crop should be grown to tone up the soil, after which good wheat crops will again be grown. If the land is to be cropped frequently, about one crop in three should be a pea crop. Under existing market conditions, it is a more practical proposition in many of our wheat-growing districts, including most of Yorke Peninsula, to encourage the growth of Burr clover, and if this very useful pasture plant is allowed to make strong growth, about every third or fourth year, wheat-sickness will be unknown. Wherever a rotation of cropping of bare fallow-wheat-pasture (in which Burr clover is prominent) is practised the land has never shown signs of becoming wheat-sick, nor does the trouble occur in a rotation of bare fallow-wheat-barley or oats-pasture (Burr clover), provided the clover is encouraged with top-dressing. The use of plenty of superphosphate and the regular resting of the land from cropping will prevent the occurrence of wheat-sickness where Burr clover is plentiful, and where this clover is scanty King Island Melilot should be introduced for the same purpose.''

Eel Worms.

''What is the best treatment for land infested with eel worms?''

Reply—''Unfortunately, once land has become infested with eel-worm, crops are always liable to attack by this pest if, for any reason, anything happens to retard their early growth. Because of this, where eel-worm has appeared, it is essential to do everything possible to ensure that cereal crops start off strongly, if damage is to be prevented. This can be done best by very careful fallowing, making certain that weeds, and particularly grasses and cereals, be killed whilst still very small. At seeding, heavier dressings of superphosphate should be used than would be the case if eel-worm was not present. After a bad attack of eel-worm, it is wise to delay the seeding of the field as long as it is safe, and then use early varieties.

When a cereal crop is showing signs of attack by eel-worm it should be fed down very hard by sheep, doing the job quickly by crowding a lot of sheep on to the affected area. Better recovery by crops often follows doing the feeding-off when the land is wet after rain, the tramping of the soil appearing to retard the activities of the eel-worm.''

[Replies given by Mr. W. J. Spafford (Deputy Director of Agriculture) to questions submitted at the Conference of Lower North Branches of the Agricultural Bureau at Owen on 27th February.]

Californian v. Cape Barley.

''What is the difference in feeding value between Californian Cape and Prior barleys for feeding to Livestock?''

Reply—Analyses of samples of Californian Cape and Prior barleys grown in South Australia show that there is very little difference between the two as grains to feed to farm livestock.

Nutrients.	Prior Barley— Composition.	Digestible Nutrients.	Californian Cape Barley— Composition.	Digestible Nutrients.
Water	13.3	—	13.3	—
Ash	2.7	—	2.4	—
Protein	8.0	5.6	8.3	5.8
Fat	1.3	1.2	1.7	1.5
Carbohydrates	70.7	65.0	69.1	63.5
Fibre	4.0	1.3	5.2	1.7
Starch equivalent	—	73.4	—	72.4

The content of the various nutrients is almost identical for both barleys, the only noticeable differences being that the Californian Cape contains 1.2 per cent. more fibre and 1.6 per cent. less carbohydrates than Prior. These differences mean that after a slight allowance is made for a lower digestibility of the Californian Cape, the starch equivalent—which is the measure of the fattening power of a foodstuff—is 73.4 for Prior and 72.4 for Californian Cape. Stated in another way: 100lbs. of Prior barley are equal in fattening value to 73.4lbs. of starch, whereas 100lbs. of Californian Cape barley are equal in value to 72.4lbs. of starch.

Wimmera Rye Grass.

''Would Wimmera rye grass, in the course of time, be detrimental to wheat growing?''

Reply—There is always a possibility of crops of a similar kind, when grown on the same land, deleteriously affecting one another, and because wheat and Wimmera rye grass are both annual grasses, growing in much the same way and at the same time of the year, there is a chance that the rye grass might eventually prove injurious to wheat crops. I doubt that this will prove so, because rye grass is grown as a grazing crop, and whilst this method of handling the grass persists it does not appear likely that it will be harmful to wheat crops. Because of its similarity to wheat—if managed in a similar manner—if it was carted off the land it might lower the fertility of the soil to the extent of affecting wheat crops, but this has not proved to be so with oats and barley, at all events when grown in a reasonable rotation-of-cropping with wheat, and they are more closely allied to wheat than is Wimmera rye grass. Wimmera rye grass may eventually become a bad carrier of ''take-all,'' but the grass has not so far exhibited any signs of becoming bad in this regard, and even if it does, we will be no worse off than at present, because it is most unlikely that it can get worse than barley grass as a host for the dreaded ''take-all.''

To date, Wimmera rye grass has proved wholly good, and a most useful addition to wheat-growing farms, and if continued to be handled in a manner similar to what is now the common practice, it is more likely to do good by increasing the organic-matter content of the soil than to do harm in any way.

Californian v. English Barley.

''Does Californian Cape barley take more out of the ground than English malting barley?''

Reply—Crops of Californian Cape barley generally take more out of the soil than crops of English malting barley, because the yields secured will be higher, and so more grain will be carted off the land. All of the cereals, wheat, oats, barley, and rye collect from the soil almost exactly the same amounts of the various plant foods per ton of crop produced. Crops of wheat, oats, barley, and rye grown in the same season, and yielding 1 ton of hay per acre, will all have removed almost exactly similar amounts of all the mineral plant foods.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

''Brimpton Lake'' asks treatment for a mare which stamps and bites her hind foot.

Reply—This is probably due to the presence of a small parasite. Try the following treatment:—Apply with a body brush a little of the following mixture, rubbing it in thoroughly:—Lysol, 4 tablespoonsful; raw linseed oil, 1 pint; shake well before use. Apply two or three times at three-day intervals. Sump oil from a car may be used, but in hot weather may blister the skin.

Secretary Blackheath Agricultural Bureau reports pigs with a ravenous appetite for fowls' manure.

Reply—Fowl manure is rich in lime and phosphorous, and this may be the attraction such manure has for pigs. In addition, however, this craving may also be due to a deficiency of protein in their diet. To remedy the mineral deficiency the following lick should be supplied:—Sweet bonemeal, 10lbs.; powdered limestone, 10lbs.; common salt, 1lb.; mix thoroughly. Allow pigs free access to the mixture at all times.

Secretary Agricultural Bureau, Marama, asks:—(1) *Is Berg oil a good medicine for horses?* (2) *Is Stockholm tar a good thing for stock for sore throats, colds, &c.?* (3) *A drench for cow getting to wheat?*

Replies—(1) Bergol is a proprietary preparation, and is not listed in any of the pharmacopias; therefore its formula is not obtainable. It is a preparation used extensively among stockowners in this State for the treatment of colic. (2) Stockholm tar is obtained from pine trees from Stockholm by a distillation process of the refuse woods. Tar has many properties, being antiseptic, stimulant, expectorant, &c., and, taken internally, is useful in cases of colds and bronchitis when a discharge is present. There is nothing to prevent stockowners using Stockholm tar. (3) The following drench is a serviceable one:—Baking soda, ½lb.; Epsom salts, ¾lb.; treacle, 1lb.; water, 2 pints; to be given as one drench. Baking soda should be given for two or three days twice a day in 2oz. doses, dissolved in a pint of water.

Conference Yorke Peninsula Branches: ''What is the cause of lack of milk in breeding sows a few days after farrowing? What could be done to avoid it?''

Reply—Some of the causes of this condition are:—Mammitis (inflammation of the udder).—This is fairly common. The udders become hot, painful, and very tender to the touch, and the milk supply ceases, or is low. The sow resents the young pigs sucking. Treatment.—Give sow a dose of Epsom salts, and rub affected udders with the following mixture:—Olive oil, 4 parts; liquid extract of belladonna, 1 part; apply warm. Prevention.—(*a*) See that sow's bowels are kept regulated prior and subsequent to farrowing. (*b*) Put in clean, warm sty for farrowing, and before doing this wash udder with Condy's solution. Any sickness of a generalised nature, especially if accompanied by fever, *e.g.*, inflammation of the womb, pneumonia, &c. The pregnant sow should have plenty of exercise, and should not be too fat. A suitable ration should be fed, bearing in mind that the sow has to provide nourishment for her young, and for this purpose it should contain ample protein. Where grain is mainly fed and no milk is available it is necessary to give green lucerne, meat meal (boiled rabbits), &c. Further, where skim milk is not available and grain is the main feed, the following mineral mixture should be fed:—Agricultural lime, 1 part; dicalcic phosphate, 1 part; common salt, ½ part; of this mixture add 2½lbs. to every 100lbs. of grain. (NOTE.—It is important that the lime be thoroughly slaked.)

Conference Yorke Peninsula Branches: "What is the cause of weak stifle in young stock. Would it be hereditary?"

Reply—This condition is not uncommon in young horses and is really a dislocation or slipping out of position of the small bone in front of the stifle joint. In acute cases, the leg is held in a semi-flexed position with the toe only touching the ground. In chronic cases, the bone during progression slips in and out of position with a clicking movement. *It is often hereditary in the horse,* but may be due to an injury. In acute cases, the dislocation can be reduced by forcing the animal to make a sudden movement forward, by backing or by passing a sideline around the pastern of the affected foot and pulling the leg into position. A blister is then applied to the region of the pastern. In chronic cases treatment may not be satisfactory. In young colts it may disappear as the animal gets older. A blister could be tried.

HORTICULTURAL INQUIRIES.

[Replies given by Mr. A. G. STRICKLAND, M.Agr.Sc. (Chief Horticultural Instructor) to questions submitted at the Conference of Lower North Branches of the Agricultural Bureau held at Owen on 27th February.]

"Has anything further been done in the matter of the depth ploughing test for orchards and vineyards?"

At the Balhannah Conference in November, 1934, a resolution was passed requesting that experiments be conducted on early and late ploughing for fruit trees. At a later date, it was discovered that the resolution should have read "shallow and deep" ploughing.

After this clarification, the opinion was expressed that deep ploughing of vineyards would be advantageous in non-irrigated districts, but doubted the possibility of gaining definite experimental evidence on the point, owing to the interaction of other vineyard factors in any experiment laid down.

Best orchard and vineyard practice would involve the growing of greenstuff—either a sown green crop or miscellaneous herbage—weeds, &c., during winter, and incorporation of this green crop or "weed crop" with the soil before budburst in early spring. When such green crop is turned under, it should be ploughed in as deeply as possible.

The question as to whether deep ploughing or digging operations during the period that fruit trees are in full bloom is detrimental to cropping, was made the subject of an experiment on the Blackwood Experiment Orchard. (The preliminary results of this experiment are shown in the *Agricultural Journal*, January, 1935, page 784). No ill-effects on the trees concerned in the experiment were noted.

"Does the continued use of sulphate of ammonia in vineyard and orchard prove detrimental to vines and trees?"

The continued use of Sulphate of Ammonia need not necessarily prove detrimental to vines or fruit trees. On soils which have a poor supply of lime—and such soils are not common outside the high rainfall areas—excessive use of Sulphate of Ammonia may lead to some depletion of lime. For every 1lb. of Sulphate of Ammonia applied, 1lb. of lime is transformed into gypsum, and gradually washed away by downward leaching. This lime depletion induced by the application of Sulphate of Ammonia is only of importance in soils already low in lime, *i.e.*, acid soils, such as are rarely encountered in the drier inland regions.

The only other possible detrimental effect of applying Sulphate of Ammonia in excessive quantities on orchard or vineyard, would be in relation to plant growth. Within limits, growth and yield of fruit trees or vines are correlated; *i.e.*, without good annual growth, fruit production will be restricted. On the other hand, excessive growth is opposed to maximum fruiting, and if Sulphate of Ammonia were utilised to promote excessive growth, or growth at the wrong time of the year, fruiting could quite easily be adversely affected.

This condition, *i.e.*, restriction of fruit production on account of excessive vigour, is not, however, encountered as frequently as the reverse, *i.e.*, low yields on account of poor vegetative growth.

Sulphate of Ammonia is a quick-acting nitrogenous fertiliser which is perfectly safe on most soils if applied intelligently. Application should be made in early spring in the case of most fruit crops, and quantities used should be sufficient to induce that moderate vigour consistent with production of normal crops.

"What is a profitable dressing of Sulphate of Ammonia for citrus trees, and the best time and method to apply same?"

Experiments at the Berri Experiment Orchard, and, in fact, in almost every centre in the world where citrus is grown, have indicated the necessity of applying nitrogen to citrus trees. In fact, without adequate nitrogen, yields decline, and the trees become definitely unthrifty.

The amount of Sulphate of Ammonia necessary to maintain tree health and good cropping depends largely on the nature of the soil, and on the cultural practices employed. It is, of course, sound practice to grow winter green crops between rows of citrus, and plough these under in early spring. Where peas, beans, or other legumes are used for green cropping, nitrogen is added to the soil from the air, and if green cropping is regular, the demands for inorganic nitrogen as Sulphate of Ammonia) may not be so pronounced. Organic matter is of first importance, and by green cropping, or the use of farmyard manure, &c.. the soil humus content must be maintained.

Having applied as much organic matter as possible, the amounts of Sulphate of Ammonia to be applied annually may vary from ½lb. to 4lbs. per tree, according to age, for trees up to eight years old. On older trees as much as 8lbs. to 10lbs. of Sulphate of Ammonia per tree, and even higher quantities have been applied with advantage. Exact maximum profitable quantities cannot be quoted, as these will depend on such factors as district, the soil type, the size of tree, the amount of organic nitrogen used, etc..

The bulk of the annual dressing of Sulphate of Ammonia should be applied in early spring (say August). Often the whole annual amount may be applied at this time, but it is sometimes desirable to apply portion as an autumn dressing. As an autumn dressing 25 to 30 per cent. of the full annual dressing may be applied in early autumn or late summer; however, if a dressing applied at such time stimulates excessive autumn growth, the dressing should be reduced, or even omitted, and applied in spring. Generally speaking, the maximum demand for nitrogen occurs in early spring.

All fertilisers should be placed as deeply as possible in order that they may quickly reach the root zone. Very often Sulphate of Ammonia is applied in a ring round the tree spread, and ploughed or cultivated under. If the fertiliser can be placed at the bottom of a deep furrow, this is very desirable.

"Has the Blackwood Experimental Orchard had any success with new sprays for Codling Moth?"

The following spray materials have been used (some widely, some only on an experimental scale) as sprays to combat Codling Moth. All these materials were fully discussed by a meeting of the Interstate Codling Moth Committee held last year.

1. *Arsenate of Lead.*—Standard spray; objection is residue on fruit.

2. *Barium Fluosilicate* (or *Dutox*).—This material also leaves an objectionable residue. Furthermore, it has not given as good control as arsenate of lead.

3. *Calcium Arsenate.*—In tests conducted in Queensland, this material has been shown inferior to arsenate of lead.

4. *Manganar Magnesium Arsenate and Sodium Aluminium Fluoride.*—These two materials also leave objectionable residue, and so far have not proved any better than arsenate of lead in controlling Codling Moth.

5. *White Oils.*—White oils alone, and in various combinations with derris, nicotine sulphate and arsenate of lead, have been experimented with, and some of the combinations have shown promise. Oil and arsenate of lead cannot be freely recommended later in the season, owing to the fact that it may leave a residue almost impossible of removal by either wiping or washing. On certain varieties (such as Cleopatra), and in certain districts, white oil alone has given much trouble in the form of fruit spotting. Experiments are in progress at Blackwood on this and other matters; and at present the use of white oil on the Cleopatra variety cannot be freely recommended in all districts.

6. *Nicotine Sulphate and Bentonite Sulphur.*—Recent work in America has shown this spray to be very effective in controlling Codling Moth. Bentonite sulphur is a compound made by fusing colloidal sulphur and "Bentonite"—a colloidal clay which occurs naturally in parts of America. The resulting compound has highly colloidal properties, and when used with nicotine sulphate in spray mixtures, fixes the nicotine sulphate so that it remains effective as a stomach poison, and contact insecticide over a much longer period than when used in other combinations. This new spray, together with other standard schedules, is being tested by the Blackwood Orchard this season; although giving apparently fair control of Codling Moth, the bentonite sulphur-nicotine sulphate spray has imposed a heavy spray residue on fruit, and, on present indications, this residue is going to be exceedingly hard to remove.

Work on various sprays for Codling Moth by the Department of Agriculture has been extended in the past year, and during the next few years, particular attention will be paid to the most promising of the non-arsenical sprays—white oil alone, and combined with derris or nicotine sulphate, and mixtures of bentonite sulphur and nicotine sulphate.

Until further work has been carried out, we are not in a position to suggest alternatives to the widely used materials—arsenate of lead, and white oil.

The former material will give effective control if sprays are timed properly, but involves wiping or washing of fruit for removal of residue. White oil used alone, or with nicotine sulphate in the last three sprays, will overcome the residue problem, but may lead to spotting injury of some varieties, such as Cleopatra.

ACTIVITIES AT ROSEWORTHY AGRICULTURAL COLLEGE, 1934-35.

[By ALLAN R. CALLAGHAN, D.Phil., B.Sc., (Oxon); B.Sc.Agr. (Syd.) (Principal).]

(*Continued from page* 906.)

PART V.—LIVESTOCK.

Livestock activities play a very important part in the work of the College; in fact, the management of the property is to a large extent directed by livestock requirements. I have already stressed the need for the incorporation of livestock as an integral and very essential feature of a true and permanent agricultural system. With the advent of livestock comes greater diversification of farming combined with an actual necessity to farm, to a greater or lesser extent according to circumstances, for the animals which are being maintained. In a general way, therefore, the management of such a mixed farm is very largely controlled by the requirements of the animals being carried from time to time. In this section of the report I desire to deal specifically with items of interest concerning the progress made in certain aspects of animal husbandry at the College. In doing so I am fully aware of the incompleteness of the report, but I also feel that much of the information gathered from certain phases of the work for our own use and guidance should prove of definite value to many who are concerned with similar practical problems of animal husbandry.

The 1934 Drop of Foals, the first sired by "Cyrus," was a particularly even lot.

THE HORSES.

The year 1934-5 with the horses was one of great interest, and one which should stand as a definite year of progress, for during the year the first progeny of the Clydesdale stallion Cyrus (2455 N.Z.C.S.B.) was foaled. Thirteen foals were reared; they all expressed great character and similarity indicating a very pleasing prepotency of the sire. These foals were inspected by many interested parties. Visitors, without exception, were surprised with their general quality.

It is of especial interest to note that not since 1916 have so many foals been reared at the College in one season. The number showed a substantial increase over the immediately preceding years, in fact, the average number foaled from 1920 to 1932 was four; in 1933, seven were reared; thus in 1934 and coinciding with the advent of Cyrus, the thirteen foals reared offer a favourable comparison.

Of the 1934-5 foals, one only was eligible for the stud book; this was a colt from the only Stud Book mare the College possesses, Kowai Gyp. This colt was named Roseworthy Nomad (C.C.S.B. 2166) and was sold to a purchaser on the West Coast soon after weaning.

Of the others, one filly has been registered in Appendix A and two fillies are registered as progeny and are eligible for Appendix B.

FEEDING TESTS WITH MARES AND FOALS.

As paddock feed was very limited and stubble paddocks did not last long, a definite programme of feeding the mares-with-foals was undertaken, and in order to measure the results of the ration and maintain the interest of students, the rations were carefully worked out, and weights of foals and mares followed during the course of the feeding.

A Loose Stack of Silage, made from volunteer growth, consisting chiefly of Burr Medic (or Burr Clover) and Self-sown Cereal, built in 1933, opened out in perfect condition for feeding the following year.

The ration feed was dependent chiefly upon what was available on the farm; it was assessed in accordance with the Morrison or Modified Wolff-Lehmann feeding standards. The results from the feeding were very striking and demonstrate the value of the ration.

The daily feed was worked out for a mare and four months old foal weighing together approximately 2,100lbs. and consisted of:—

35lbs. Wheaten Chaff.

20lbs. Green Lucerne.

4lbs. Peas } Mixed and crushed.
2lbs. Wheat }
2lbs. Barley }

½lb. Linseed Meal.

According to standard analyses of the constituents, the ration conformed with recognised requirements for a mare suckling foal, with a nutritive ratio of approximately 1 : 7.5.

On this ration, twelve mares and twelve foals did remarkably well and for the period 4th February to 28th February both the mares and foals in every case showed quite significant increases in weight. The average increase per day per foal for this first three weeks was 3½lbs., while the mares showed an average increase of 4⅝lbs. per day. For the period 28th February to 18th March, when the weaning of foals began, the foals continued to increase in weight, while the tendency was for the mares to remain more steady, although one or two continued to increase considerably in weight In the latter cases the foals did not benefit to the same extent and did not show the same high increase as those on mares showing less tendency to fatten.

A Close-up View of a Fork full of Silage, taken from the loose silage stack shown in the previous illustration. The fodder was beautifully preserved; its olive green colour and fruity odour made it especially palatable to livestock. The next two illustrations show sheep and lambs being fed with this silage.

One mare foaled out of season and she and her foal were placed immediately on the same ration as the above. This mare's foal showed a daily increase from birth of 3¾lbs., whereas the gain per day of the other foals from birth and up to the time of feeding them a full ration was only 2⅜lbs. While this work is by no means conclusive, it indicates that balanced, and more carefully arranged feeding of mares and foals will give results.

On weaning at the age of 5½ to 6 months the foals averaged approximately 750lbs. weight and they were fed the following ration:—

12lbs. Wheaten Chaff.
10lbs. Green Lucerne.
1lb. Peas
½lb. Wheat } Mixed and crushed.
½lb. Barley
¼lb. Linseed Meal.

Seven foals were shut off from the mares on the 18th March and fed the above ration and for the period 18th March to the 8th April, 1935, they showed an average daily increase in weight of 3½lbs. per head.

This gain in weight over the weaning period indicates that the foals received no check and is good evidence in support of feeding a well balanced ration at this critical period. A definite check in growth accompanied by a general debility and proneness to worms—so often associated with weaning—may be avoided by proper feeding. In this test the foals showed a thrifty, sleek, well-conditioned appearance throughout, with no tendency to harshness of coat which accompanies loss of condition when weaning is carried out without proper attention to growth requirements.

The Dorset Horn-Merino Half-bred Test Flock, with Lambs by Southdown Rams at foot being Silage-fed on the 2nd March, 1935, on the occasion of a field day. Note the bareness of the stubble paddock in contrast with the splendid general condition of both ewes and lambs.

All the foregoing is merely test work and is hardly experimental for the simple reason that no control lots were fed; in this connection, advantages of feeding are well known and it would not be fair to neglect the feeding of half the year's foals to prove a point that is common knowledge. The results here summarised are given as a guide to some and a point of interest to others.

THE FEEDING OF LAMBING EWES ON SILAGE UNDER DROUGHT CONDITIONS.

Throughout the Lower and Middle North districts and the West Coast, fat lamb breeding has made very rapid strides and with a buoyant lamb market the development is sure to continue. Farmers who study the position carefully must realise that there are times during the season when the market is well supplied; they must also realise that there are periods when very few really choice sucker lambs are available.

In the past two seasons the College has endeavoured to meet the early market and to demonstrate to the farmer how such can be done without risk of failure. By using Dorset-Horn-Merino half bred ewes mated to Southdown rams, an early lambing was planned in 1934. On this occasion the lambs were dropped at the end of February and the beginning of March and the flock was fed silage in stubble paddocks. However, the season opened early and with the lambs only 3 weeks old, excellent green feed became available. The risk had been run because of good silage supplies on the farm and fortunately the opening rains were early. From this flock of 100 ewes, 110 lambs were marketed and the first consignment was sold at the local Abattoirs market on the 4th June, 1934, for the excellent return of 28s. 10d. per head. The lambs from the whole of this flock averaged £1 3s. 3d. per head.

This in itself indicates the value of meeting the market early; to do so year in and year out involves a certain amount of risk as the opening rains—although fairly reliable—may be unduly delayed.

It is the occasional season when the opening rains of late April or early May are poor or not supported by good following rains that makes most farmers avoid any risk, and they mate the ewes so that the earliest lambing is in June. This is what the majority do, and consequently the market becomes congested in August and September, whereas few high quality lambs are marketed before July.

In a normal year—opening during April or May—the April-May dropped lambs grow much more quickly because the weather is much milder than in June and July and there is less loss of new born lambs for the same reason. These lambs are marketed almost two months earlier than the June dropped, and consequently in normal seasons realise much higher prices.

The problem of the farmer is to provide some means of feeding as a safeguard against a late opening of the season, because once the risk is removed, considerably greater returns may be obtained by the earlier lambing. To demonstrate how best this might be done, a trial was arranged using silage as the base and some grain as a supplement. The main idea was to see what could be done with silage should an emergency arise, and to make certain that there would be no fresh green feed available, 40 Dorset Horn-Merino half-bred ewes were mated to lamb in January. During January, February, and March the flock was fed gradually increasing quantities of silage with a little grain (⅞th peas and ⅛th wheat) as a supplement. The average rate of feeding was 3¼lbs. of silage and ⅓lb. of grain per ewe per day in addition to ordinary cereal stubble grazing. The lambs were maintained in very satisfactory condition until the first week of April when following opening rains at the end of March greenfeed became available. At this stage feeding was discontinued. On the 24th April the first draft was sold at an average of 74lbs. live weight; these realised 21s. 10d. per head. On the 29th May a further draft realised 22s. 10d.

At the time approximate costs of the feed supplied were as follows:—

	s.	*d.*
292lbs of silage at 10s. 6d. per ton	1	4
34lbs. of peas at 3s. 6d. per bush.	2	0
5lbs. of wheat at 2s. 8d. per bush.	0	3
	3	7

At first glance it may appear that the cost of feeding was high, but returns showed a net return of 18s. 8d. on the first draft and 19s. 8d. on the second draft; this, it will be admitted, shows the proposition to be profitable. The important point, however, is that this flock was fed for three months because of the purposely arranged January lambing, whereas one or two months is likely to be the limit of feeding during an ordinary late season. In this way such supplementary feeding as would be necessary would be less prolonged and so cheaper. Again, when these drafts of sucker lambs were available there were no others on the market or any likelihood of any for another two months, so that butchers were loth to buy at a high price when continuity of supply was impossible. This statement is substantiated by the sale of a draft of lambs of the same breeding marketed on the 25th June when sucker lamb was becoming more prevalent which realised 24s. 7d.

A Close-up of the Dorset Horn-Merino Half-bred Ewes and Lambs during feeding, taken on the same occasion as the previous photograph. It will be seen that, in spite of the photographer, the lambs and ewes are eating the silage with relish from the feed trough. Their flourishing condition is evident.

The price less 1s. or 2s. for feeding is a very attractive one and almost worth the risk of a late season, but with ensilage stored on the farm the risk is definitely removed and any farmer in the agricultural regions can avail himself of the possibilities of earlier lambing, providing suitable and adequate reserves are held on the farm.

EXPERIMENTS WITH PIGS.

During the year a feeding trial with pigs was completed and a separate and detailed report on this work was submitted by the Dairy Superintendent, Mr. R. Baker, and has been published through the *Journal of Agriculture.* The idea behind the trial was to test the relative values of wheat and barley with and without supplementary foods, and to demonstrate how best either barley or wheat could be utilised for the production of pork or bacon. Pigs of different breedings were represented in the trial, namely pure Berkshires, and crossbreds from the following crossings, Large White x Berkshire, Large White x Middle Yorkshire, Tamworth x Berkshire and Large White x (Tamworth x Berkshire).

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There were Six Pens of Six Pigs each in the Feeding Trial carried out to compare Barley and Wheat as basal foods for pigs. The Pigs shown above were on the wheat, skim milk, and lucerne ration. Pigs of the following breeding, from left to right, are shown in the photograph:—Large White x Tamworth x Berkshire; Large White x Berkshire; Large White x Middle Yorkshire; Large White x Berkshire; Berkshire, and Tamworth x Berkshire.

Some very interesting results were obtained and they demonstrated the great value of supplementary foods such as skim milk, lucerne, and meat meal for balancing basal rations of either wheat or barley. Under the conditions of the trial and assuming the value of pork at 5½d. per lb., wheat fed to pigs alone, with meat meal, and with skim milk and lucerne, would be worth respectively 3s. 10½d., 4s. 7d., and 5s. 5½d. per bush., and similarly barley fed alone, with meat meal, and with skim milk and lucerne, would be worth respectively 2s. 10½d., 2s. 7½d., and 3s. 9¼d. per bush.

The pigs in this trial were fed to bacon weight, slaughtered by the Export Department and sent overseas, from where comments were received on the different carcasses in the trial. The pure Berkshire pigs, irrespective of how fed, were regarded an unsuitable for export trade purposes, being too heavy in the shoulder, too short and thick in the body and far too wasteful when cut up. The pigs of crossbred breeding with Large White or Tamworth sires were favourably commented upon. It appears now that both local and overseas requirements are coming more and more into line, and light fore-ends, long bodies and well developed hams are the leading characteristics required of a good bacon pig. Pigs carrying excess fat—especially on the shoulders and along the back—are not wanted, for in satisfying the demand for leaner meat, such pigs prove very wasteful when cut into joints and pieces.

Knowing the general requirements of the trade leads one to ask how best the requirements may be met, especially from the viewpoint of breeding? With this in mind an investigation was begun to test the relative merits of different breeds and crossbreeds on a balanced grain ration of as constant a nature as possible. It is proposed to deal with as many different crossbred types as practicable and so far pigs of the following breeding have completed their test, Large White x Berkshire, Tamworth x Berkshire, Large White x (Tamworth x Berkshire), Canadian Berkshire x Old Type Berkshire, and Tamworth x Large Black. The carcasses of these pigs have been sent to England and criticisms on each will be duly received.

This experiment will take some time to complete, but it should eventually supply some very useful information with respect to the most suitable breeding to follow to meet the export trade.

ENTERO-TOXAEMIA IN SHEEP.

"Has anything further been done towards a remedy for entero-toxaemia in sheep, and has a vaccine used against this disease proved effective?"

A considerable amount of investigation work has been carried out in Western Australia by the Council for Scientific and Industrial Research on this disease.

There is little doubt that the Western Australian disease is identical with that disease of sheep in South Australia known as "Braxy-like" disease and "Stinkwort Poisoning," and also with the disease of lambs called "Pulpy Kidney." The cause of entero-toxaemia has been discovered, and it has been found that the disease is produced by the action of a powerful toxin (poison). This toxin is manufactured under certain conditions in the small gut of the sheep by a special bacillus.

A vaccine has been produced which, when inoculated into sheep, has given very good results in enabling them to resist entero-toxaemia. Its use is recommended in this State. Investigational work is still being done on the use of this vaccine.

It is suggested that pregnant ewes be vaccinated in the early stages of pregnancy.

THE DRAUGHT HORSE.

[By F. H. FRANCIS.]

[*At a recent meeting of the South Australian Branch of the Commonwealth Clydesdale Horse Society, Mr. Francis, by request of the Committee, gave an address (illustrated by lantern slides) on "The Draught Horse." Mr. Francis stated that he was more deeply interested in the Clydesdale breed, and, as the Clydesdale embodied all the characteristics of the true draught horse, he dealt at length with this breed. Brief references were made to other breeds.*]

The Clydesdale horse, as the name would imply, originated in Lanarkshire, Scotland, through which district the River Clyde flows. There is, however, no authenticated data concerning its origin previous to the year 1715, when John Paterson, of Lochlyoch, on the estate and in the parish of Carmichael, purchased in England a Flemish stallion. This horse possessed great quality of hoof and limb—a character which he passed to his offspring to a very marked degree, and so improved the breed in the Upper Ward to make them famous all over Scotland. The Lochlyoch mares were, generally, browns and blacks. They had grey hairs in their manes and in their tails, occasional grey hairs in their coats and, almost invariably, a white spot on their bellies. This latter marking was always regarded as a distinct indication of purity of blood.

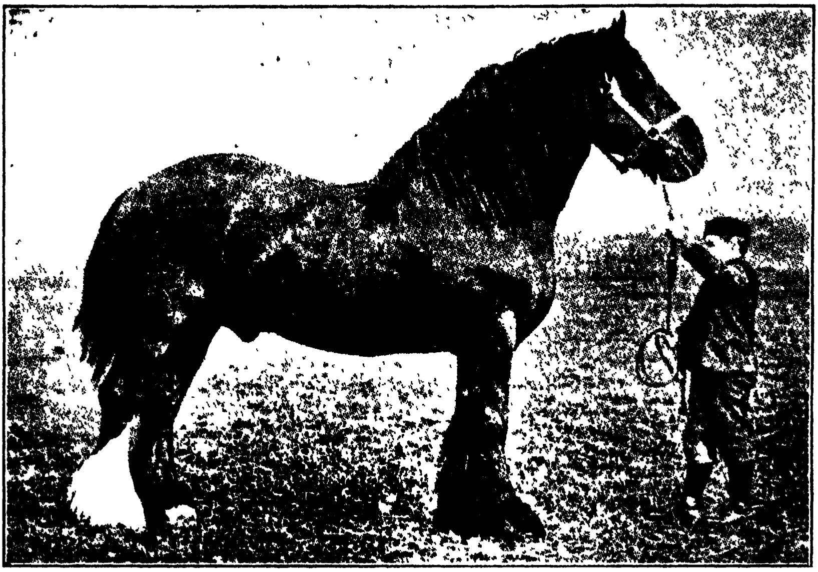
Another horse which greatly improved the breed was Blaze, purchased by a Mr. Scott, of Brownhill, Carstairs. Blaze was purchased as a two-year-old in Ayrshire about the year 1780. He imparted to his stock great style of action, very shapely bodies, and good wearing qualities of foot and limb.

More modern than the Lochlyoch or the Brownhill Clydesdales are those known as "The Lampit's Strain." At the dispersal sale of the stock of Thomas Clarkson, of Shott's Hill Mill, Parish of Carstairs, Lanarkshire, in the year 1808, Mr. Sommerville, of Lampit's Farm, purchased a two-year-old filly with which he founded his stud. This filly had several filly foals, all of which became famous brood mares, but it was as mother of Glancer that this Lampit's old mare, as she became known ultimately, was destined to become famous in the history of the Clydesdale breed. It is from Glancer that all the best and most noted Clydesdales are descended. Glancer is traceable through many generations back to the Lochlyoch mares and to the black horse of 1715.

In the year 1827, a new epoch in the history of Clydesdale breeding was inaugurated by the Highland Society holding its first open show for stallions and for mares. At this show, good prizes were offered for animals calculated to improve the type of horse for working heavy land along the valley of the Clyde. This gave Clydesdale horse breeding considerable impetus, and the breed became very popular, and its distribution very wide; so much so, that it became impossible to retain its progress in living memory. In the circumstances, some form of pedigree recording became imperative, with the result that the Clydesdale Horse Society of Great Britain and Ireland was founded. This took place in June, 1877, and the first or retrospective volume of the Stud Book was published in 1878. Since then, there has been an annual publication containing the pedigrees of, approximately, 60,000 mares and 25,000 stallions registered-numbered. Consequently, the pedigrees of Clydesdale horses are public property. The qualifications required for inclusion were three top crosses in the case of a stallion of Clydesdale breeding, and two top crosses for mares.

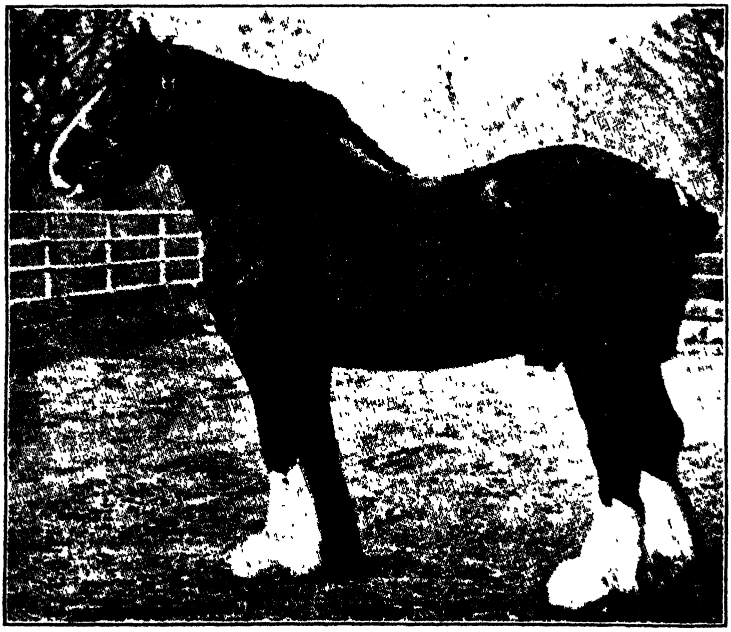
COMMENTS ON SOME NOTABLE HORSES.

Darnley was a very sound and good foundation sire, traceable to Glancer and to the Flemish horse of 1715. It is from Darnley that all the most fashionable lines of blood are descended. Comparing his lower limbs, more particularly the hind, with those of his third great-grandson, Baron's Pride, will give some idea of what can be accomplished by the application of science to breeding through selec-



DARNLEY, by Conqueror

time mating and correct breeding. Darnley was a leader in his day, winning many prizes at the Highland and Agricultural Society Show. He lived to the age of 14 years, and did the breed great service as will be noticed in the description of other horses mentioned later.

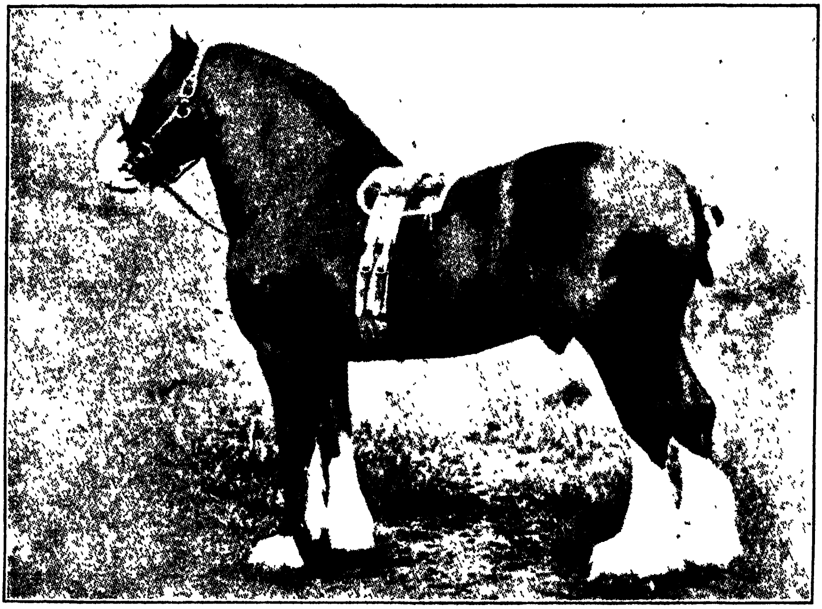


SIR EVERARD, by Top Gallant..

Top Gallant was Darnley's most famous son. An illustration of this horse which played an important part in improving the breed is not available. Top Gallant distinguished himself as a breeder in getting among others, that great horse Sir

Everard, which was an epoch-making sire. Here is the greatest line of blood known to the breed, showing a distinct change in the set of the limbs. Sir Everard was up to a big size, standing 17.1 hands at the shou'der, weighing 20¾cwts., and girthed 8ft. at six years of age.

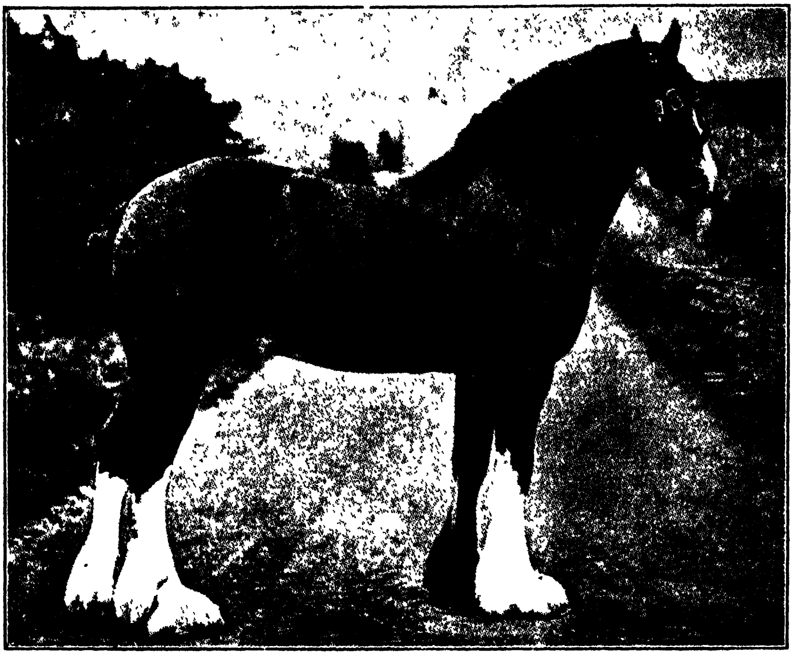
Sir Everard mated with the Springhill Darnley mare Forrest Queen, and produced the famous *Baron's Pride*. In this horse there was a great change in type and in character generally. The neck rose out of the shoulder tops; the fore legs were well in under the body and, above all, there was a distinct difference in the under pinning; the pasterns were much longer and set at a greater angle; the joints were more defined; the bones more flinty, with tendons well detached; the hock was higher up the leg and, in my opinion, this was the greatest step towards improvement in the evolution of the Clydesdale horse. This was a line-bred horse to Darnley, and was a great breeder both of stallions and mares. He passed his quality of foot and limb to his offspring, which was a very desirable character in those days. A great galaxy of champions were sired by Baron's Pride, and his influence is still very noticeable and his blood much sought after.



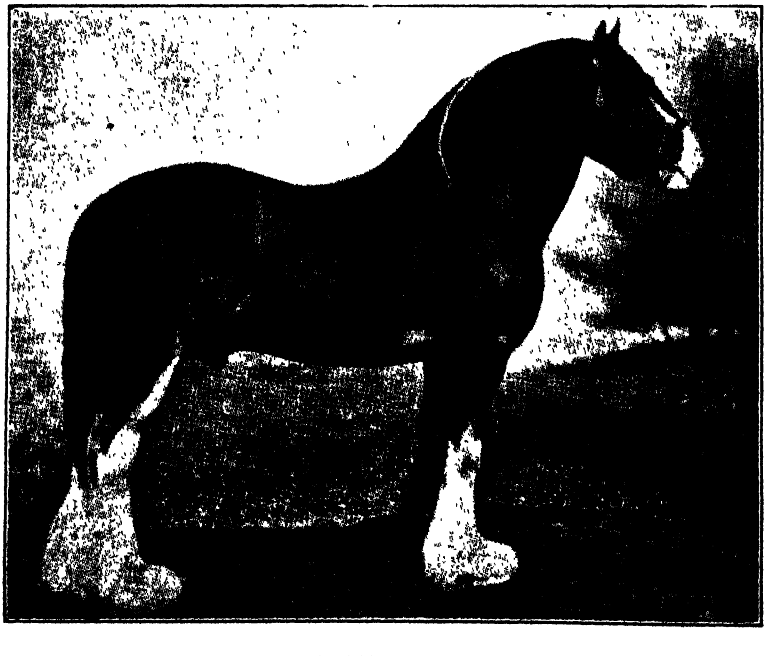
BARON'S PRIDE, by Sir Everard.

Baron's Pride united with the Knight Errant mare, Young Maybloom, and gave the world's record-priced horse, *Baron of Buchlyvie*, which was sold in the Ayr market for £9,500. He was a beautiful specimen and, like his sire, was well set up, with a perfect hind leg. Not only did he have a good hind limb, but, fortunately for the breed, this was a dominant character.

Before the Baron of Buchlyvie met his untimely end, by accident, he mated with the Auchenflower mare, Dunure Ideal, and gave the greatest draught stallion the world has known, *Dunure Footprint*. The accompanying illustration shows Dunure Footprint at 13 years of age, when he was at the height of his fame. Here we have two great blood lines springing from the one foundation, meeting in the culminating point of the production of the greatest family known to the breed. There were five full brothers and sisters, all of which won the Championship of the H. and A. Society in their turn. There was wonderful strength of character in Dunure Footprint's great masculine head; he had a grand full body; his legs were correctly put into him; his iron-grey colour shone like the sheen of silk; and he could move



BARON OF BUCHLYVIE by Baron's Pride

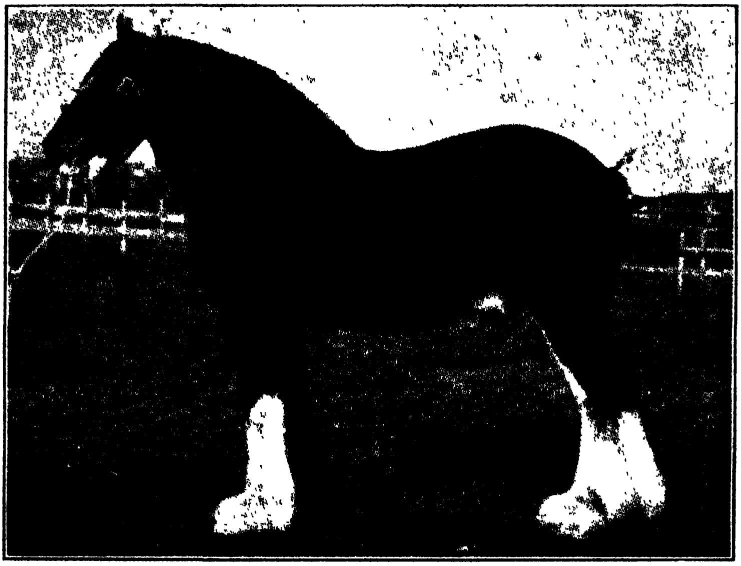


DUNURE FOOTPRINT, by Baron of Buchlyvie.

like an Iceland pony. Most of the show-winning horses in Scotland at the present time owe their merit to the influence of this great sire, and similar successes will follow in future generations of his line. Tracing his ascent to Darnley, he was by Baron of Buchlyvie, by Baron's Pride, by Sir Everard, by Top Gallant, by Darnley. He was line-bred, and it was through Auchenflower, the sire of Dunure Ideal—the dam of Footprint—that MacGregor came into the picture for Auchenflower was by Montrave Mac, by Macgregor, by Darnley. But there were other infusions of Darnley blood in the veins of Dunure Footprint. The sire of the dam of Baron's Pride, Springhill Darnley, was by Darnley, and again, Knight Errant the sire of the dam of Baron of Buchlyvie, was by Top Gallant. There was, therefore, a predominance of Darnley blood in this line-bred sire which was of such a wonderful breeding and showyard success.

Auchenflower was a great type of cart horse, and a very influential sire. Among the most famous of his daughters were Dunure Ideal, Wells Mescal, and Monk Gladys.

Rosencraig was one of Dunure Footprint's very best sons, and was exported to New Zealand by Mr. David Adams. Rosencraig has given great service to the breed in New Zealand, and there are some very fine stock by this horse in that country.

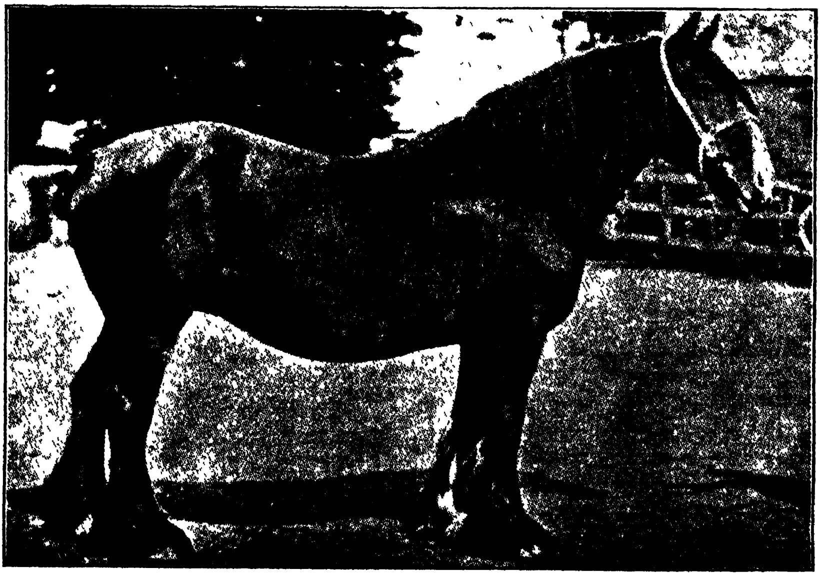


BENEFACTOR, by Fyvie Sensation

Hiawatha, by Prince Robert, winner of the Cawdor Cup on four successive occasions, was a great stud success, siring many good mares. The Cawdor Cup, the blue ribbon championship of the Clydesdale world, must now be won four times by the one exhibitor with different animals each year before it becomes his property.

Flashdale (imp.), by Dunure Footprint, from Harviestoun Amy, by Baron's Pride, was a line-bred horse, a Cawdor Cup champion, and a great stud success. Here again Montrave Mac figures in the pedigree, as the maternal grand-dam, Maud of Highborgue, was by Montrave Mac. Flashdale was a very true Clydesdale horse, and his value (through his daughters) is now dawning upon the breeders of Clydesdales in Australia.

Benefactor is a horse with a history. He was bred by Mr. Wm. Mecklem. His sire was Fivie Sensation, his dam Maud of Begg by Dunure Footprint. He was purchased as a foal from the breeder by Mr. Wm. Montgomery, in whose hands he had a very successful show career, and was never beaten in his class. When the colt was four years old, Mr. Montgomery decided to relinquish Clydesdale breeding, and called a sale in the Lanark Mart, when Benefactor realised £4,400. He had then made a name as a breeder, as his first crop of foals had caused a sensation in the show ring. The new owners were Templeton Bros., of "Sandyknowe," Kelso, and from the day that the Templetons acquired him "Sandyknowe" never looked back. In the month of March following his purchase by Templetons he won the Cawdor Cup. The next year he climbed into third place in the sires' breeding list—a proud position for a horse which had only immature animals to represent him. The following year he displaced the great Dunure Footprint from his position as head of the sires' breeding list, a distinction which the latter had held for 13 years. But it was in 1930, at the stallion show in Glasgow, that Benefactor put the cope-stone on his achievements by winning first in the class for veteran stallions, then the Lumsden trophy and, finally, winning the Meiklem Gold Cup for the supreme championship. This was a great performance for a horse eight years of age, and on which heavy demands had been made during the previous three years. Benefactor had thus gained every trophy open to a Clydesdale stallion. Though he died at the age of 10 years, he has left to date seven Cawdor Cup and many other great winners. There is no doubt that Benefactor will be regarded as one of the greatest horses of the breed. He has many beautiful sons and daughters, several of which are to be found in Australia, and they are a hard line to beat.



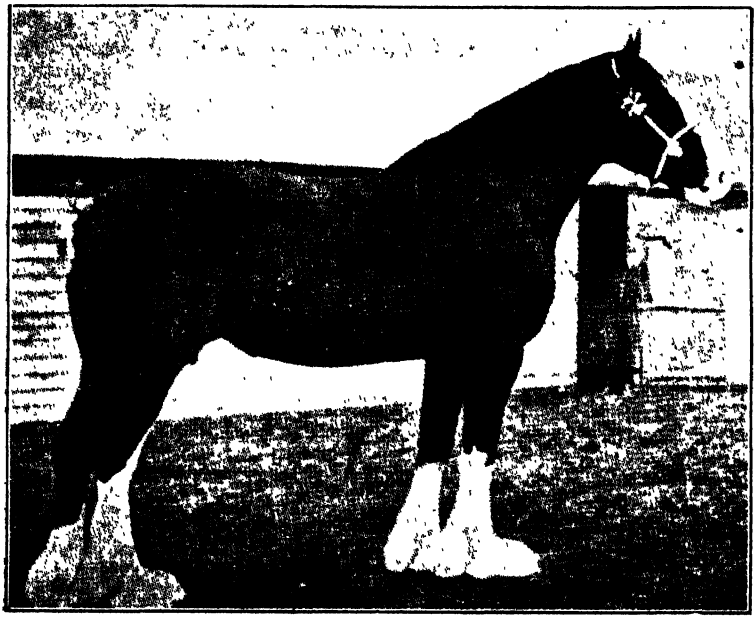
MOSS ROSE (when 13 years old), by Prince Charlie

Craigie Beau Ideal won the Cawdor Cup as a yearling, and since then has won every trophy open to a Clydesdale stallion. He is a very prolific breeder, and has now displaced the defunct Benefactor from the head of the sires' breeding list. His sire is Craigie McQuaid, his dam by Dunure Footprint.

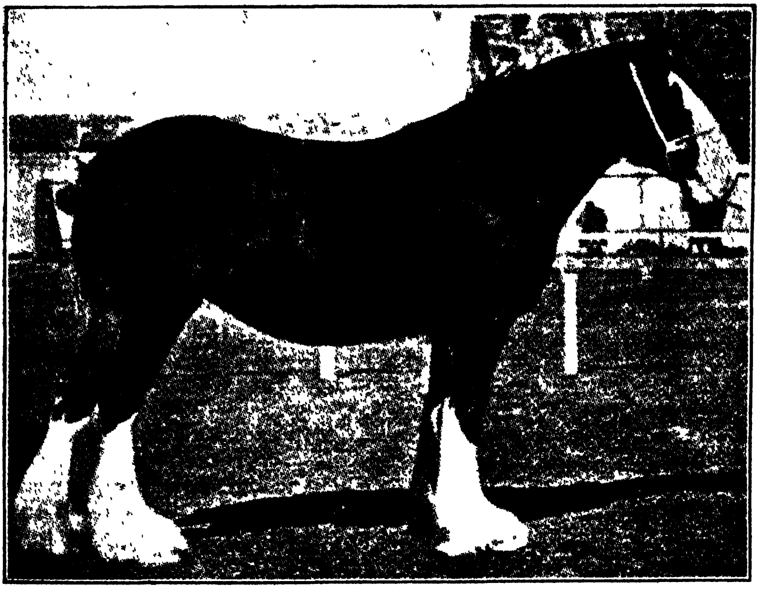
Beneficial, by Benefactor, won the Cawdor Cup as a yearling, and probably is the best young Clydesdale stallion at the present time.

FAMOUS MARES.

Moss Rose, was in equal regard, as a mare, with Darnley as a stallion. She was a very sound, good foundation mare with depth and substance, and a cup winner.



FARLETON LADY ALICE, by Dunure Footprint.



CHERRY BLOSSOM, by Dunure Footprint.

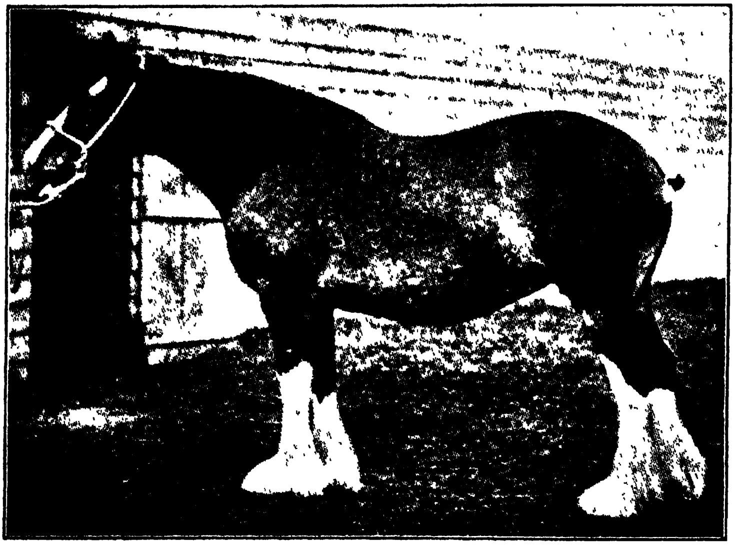
Farleton Lady Alice was one of the first daughters of Dunure Footprint, and was among the best of a great line got by that famous sire. She was the winner of the Cup on two occasions, as well as the Champion of the Royal Agricultural Society of England. She was well cut out at the ground, with beautiful class of bones.

Harviestoun Baroness, a daughter of Baron's Pride, was a Cawdor Cup winner.

Chester Princess, another daughter of Baron's Pride, was also a Cawdor Cup winner and, mated with Royal Favourite, produced the Cawdor Cup Champions, Scotland Yet and Harviestoun Phyllis.

Cherry Blossom was another of Footprint's daughters. She was described by the late Archibald McNeilage, at the time when her daughter, Mary Rose, was exported to Australia, as the best mare that ever led her class through Scottish show yards.

Dunure Ideal, by Auchenflower, was the dam of the greatest family of draught horses in the world. Very early in life she was destined to become famous in connection with the history of the Clydesdale breed. At 2 years and 9 months of age she won the brood mare class at the H. & A.S., and foaled Dunure Footprint the same night. She had four other sons and daughters that survived her, all of which won the H. & A.S. championship in their turn. Dunure Footprint and Dunure Chosen won the Cawdor Cup. Others of the family were Dunure Black Silk, Dunure Key Note, and Dunure Index. This is the type of mare to look for—full of breed character, great depth of rib, sharp hard bones, nice leashy feather and legs well placed into her great body. Dunure Ideal's fault was in her hind leg, which was a little too straight, and the hock was somewhat low down the leg. In this connection there is an object lesson showing what corrective mating will do. Baron of Buchlyvie was the sire with which this mare was mated. He had a perfect hind leg and, as he was dominant in this character, he overcame the only fault in Dunure Ideal. The result was that, as she was a mare of great breed character, she passed on all her good qualities to her offspring. This was what made her such a grand stud success.



DUNURE IDEAL, by Auchenflower.

Ambercrombie Emma is by Dunure Footprint, and is the dam of Craigie Ella, the Cawdor Cup champion by Craigie Litigant. She is now in Andrew Grant's stud in New Zealand.

Rosalind is full sister to Rosencraig, and is by Dunure Footprint. Rosalind was exported to Canada, and one of her daughters, Rosabell, bred in America, was brought back to Scotland and mated with Benefactor; produced Mr. W. G. Wilkinson's famous Faraway.

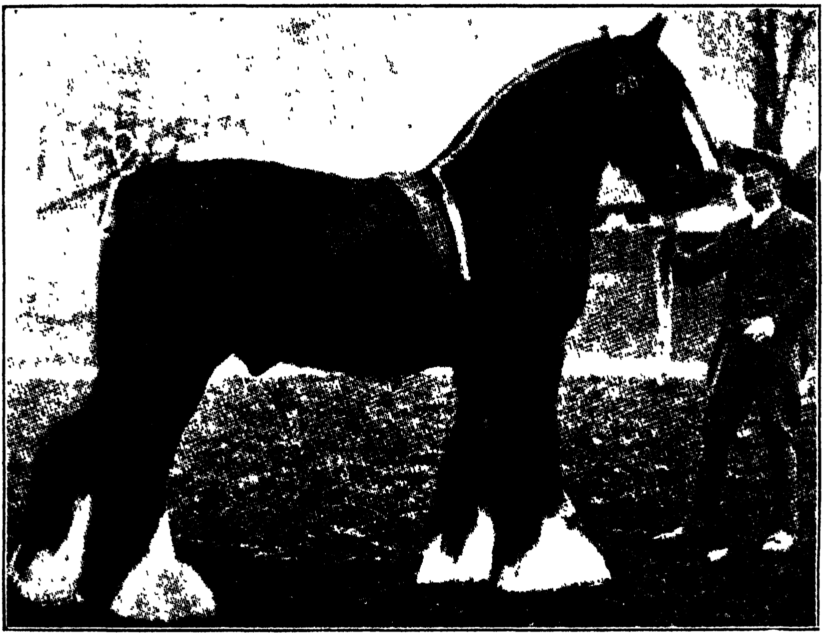
There are many very famous mares got by Dunure Footprint, including *Orange Blossom*, of which all Australian Clydesdale breeders are justly proud.

Onoway is the unbeaten daughter of Benefactor, and is breeding consistently.

Lane Lucky Girl, another of Benefactor's daughters, was a Cawdor Cup mare.

Powerful Link is another of the good class of mares, and is the property of Mr. David Adams.

There were many personalities who contributed to the success of the Clydesdale breed, and those of outstanding merit were the late W. Montgomery, of Nether Hall and Banks; the late John Finaly, of Springhill; the late Mr. Purdie Sommerville, of Sandilands; the late William Elliot, of Lanark Mart; and the late Archibald McNeilage who, for over 50 years, was Secretary of the Clydesdale Herd Society of Great Britain and Ireland.



SEEDSMAN, Shire Stallion.

SHIRES.

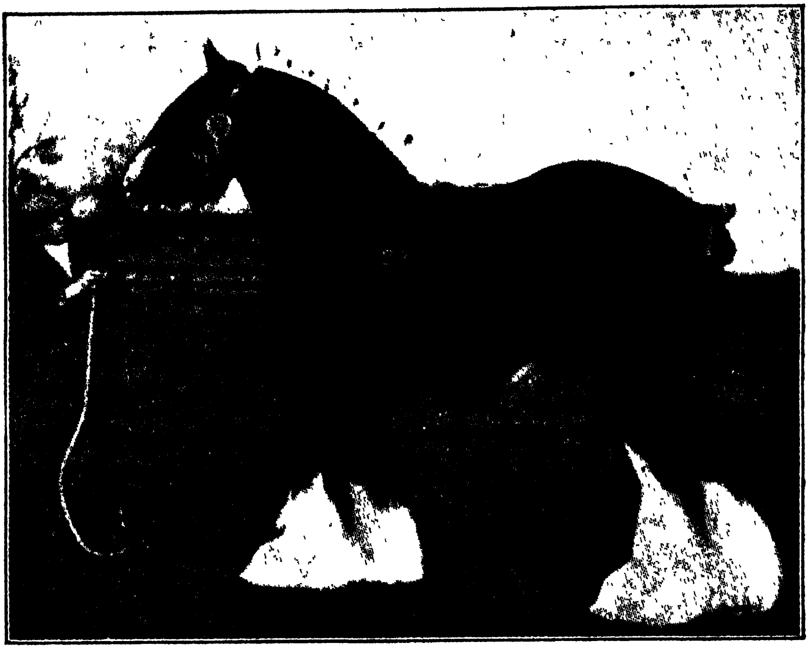
The Shire breed was largely developed and improved in the lowlands of east and central England, particularly in the district between the Humber and the Cain rivers, and extending to the Severn. The breed has been much improved by the introduction of heavy horses from Flanders, Holland, and Germany. Robert Bakewell improved the Shire Horse. The Shire Horse Society was founded in 1878, and a stud book established.

FAMOUS SHIRE HORSES.

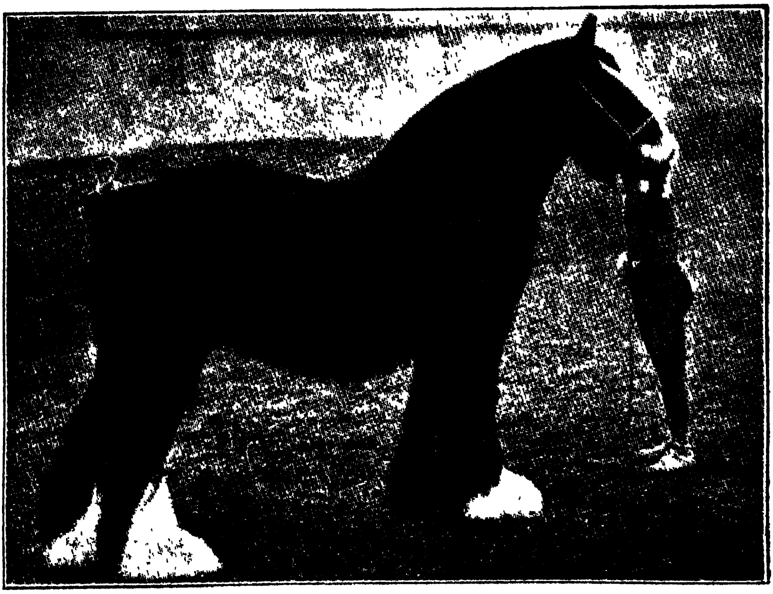
Seedsman was a winner of many prizes a few years ago. He does not, however, conform to the Clydesdale type.

Bower Winalot is quite a different specimen, and conforms more to the Clydesdale type. He was winner of the male championship at the London Shire Horse Show for the past four years.

Wick Lady Clansman is a specimen of the old type of Shire mare that was winning a few years ago.

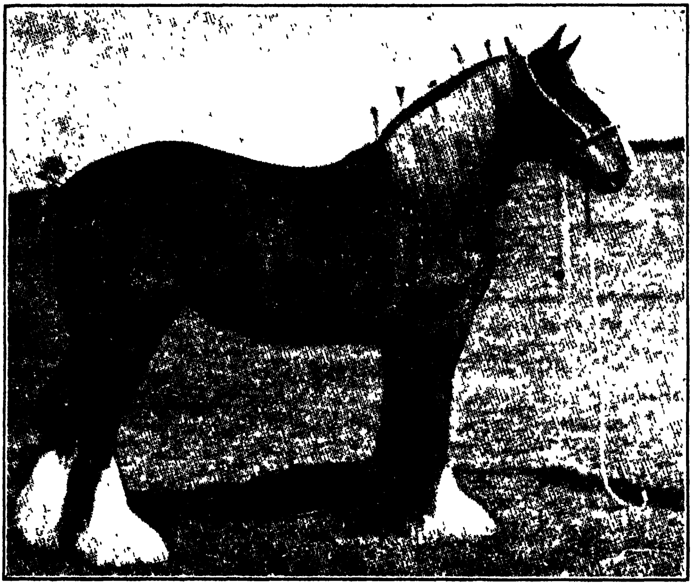


BOWER WINALOT, Shire Stallion.



WICK LADY CLANSMAN, Shire Mare.

Lymm Lady Grey won the female championship at the R.A.S.E. last year, and demonstrates the change that has taken place. She is nearer in type to the heavy Clydesdale than any Shire mare that has won the highest showyard honours. This change, brought about by judges favouring this type, is the greatest compliment ever paid to the Clydesdale breed. The most important factor which brought about this change was the judging of the Shire gelding section at the Highland Show by the late John Wilson a few years ago. A higher tribute was never paid to a Clydesdale judge.



LYMM LADY GREY, Shire Mare.

THE PERCHERON DRAUGHT HORSE.

Carburrutta is one of the famous Percherons, being successful alike at the stud and in the showyard.

Sheiden Archille is a good hardy type where the work required is hard and slow under wet conditions.

The Percheron would be a good horse where speed is not an important factor.

THE BELGIAN DRAUGHT HORSE.

The Belgian Draught Horse is a breed with an enviable record, for it is almost entirely the product of its own environment. All other breeders of draught horses added substance to their stock by the importation of ponderous sires from Flanders, the home of the Belgian horse. The people of Belgium are passionately fond of horse breeding. Their habits and the climate and soil of the country provide ideal conditions for the purpose. Since 1850, the Government has greatly assisted its people in the horse-breeding industry. The Government grant to assist horse breeding amounts to about £18,000 annually. This is given in special prizes at shows, and in bounties for approved stallions. Restrictions are placed on animals leaving the country. Bounties for the maintenance of mares are also given. The draught-horse shows of Belgium are notable events, because of the great amount of prizemoney paid. The annual show held at Brussels is by far the largest of its kind in Europe, the entries often running to 1,000. The Government of that country is to be congratulated on the fine assistance which it renders to this great national industry.

The Belgian horse is a very deep, thick animal, and capable of doing a power of show work. He is not just what the Clydesdale breeder likes at the ground, but these horses are much admired for their substance. However, the horse of any pure breed is not to be despised so long as he is up to the standard of his breed. The real menace of the industry in this country is the nondescript two-year-old, and breeders should therefore use approved, tried sires.

POINTS OF THE DRAUGHT HORSE.

A horse like Benefactor embodies all of the most essential characteristics of the modern draught horse.

When assessing the merits of the draught horse we first look to his feet, which should be deep and wide open at the heels, big at the crown, thick in the walls, with the pasterns cushioned into them at an angle of about 45 degrees. The pastern bones should be of good length so as to absorb concussion. The cannon bones should be hard in texture, sharp and broad. The tendons should be well defined, the reason being that the tendons never permanently lengthen with work, but they will permanently shorten unless they are well thrown back from the bones to give the bones the advantage over the tendon, keeping them at their natural length. This is important as while tendons have but little strength under compression, they are extremely strong under tensile strain. On the other hand, bones are very strong under compression, but are comparatively weak under tensile strain. It then becomes highly important that they be placed in the correct location.

The shoulder should be closely topped, deep and oblique, with the fore legs well back from the shoulder point and, viewed from the front, should be placed well in under the body. Here we apply mechanics, for, after all, it is a matter of angles and levers. It will, therefore, be seen that such conformation enables the animal to control properly the lower limb by lifting it up and thrusting it forward. The neck should rise out of the shoulder tops, and not out of the end of the body like that of a bobbie lizard. The head should be placed on the neck at the correct angle like that of Benefactor.

Breed character beggars description. Nevertheless, it is recognised by the born stock breeder when it is present in an animal. Without breed character the horse will be a stud failure.

The *hind leg* is the most important part of a horse's anatomy. The foot is not quite so large as the forefoot; it is somewhat deeper. The ankle is a little more inclined, and the toes slightly turned out. The shank is broader than the cannon, but of the same texture, and in the good wearing quality horse resembles in shape the blade of a hollow-ground razor. The hair flowing from the legs must be fine, free from curl, and hang from the back of the legs, both fore and hind. The hock joint should be broad, deep, and clean cut, the nape of the hock should point inward and upward, and should be close together both standing and moving. The hock joint should be placed high up the leg. This conformation not only increases the stride, but strengthens the leg, as it shortens the gaskin. This is most important, for the horse gets his leverage from the hock to the stifle. Viewed from behind, the hind legs should be closely laced together from top and bottom. The reason for this is quite obvious; when the horse is straining under a load, the closer the legs are to each other the better control he is able to exert over them. Again, the animal with the hocks low down and open behind will lose control to the extent that he will screw his hind feet on the road surface. There is nothing more destructive to the joints than this unsightly action.

The back should be short and level, the ribs should spring out from the backbone. The chest deep, the back rib well let down, making the top and bottom lines level. This is very important, for the digestive organs are located here, and it gives to the mare foal-carrying capacity. Without depth of rib, the brood mare cannot be a success, as it is not so much the height of the mare as the depth of body that constitutes her a brood mare. In going through their pacings, viewed from the side, both ends should move in unison. From the front, the legs should be carried close together, straight and true.

SOME NOTES ON THE BREEDING GROUNDS OF THE PLAGUE GRASSHOPPERS IN SOUTH AUSTRALIA.

[By H. G. Andrewartha, M.Agr.Sc. (Waite Agricultural Research Institute, University of Adelaide).]

In connection with investigations on grasshoppers, the writer visited two regions in the pastoral country during December and January in order to make a preliminary survey of the possible breeding areas of the plague grasshoppers. Grasshoppers were collected throughout the journeys, with the particular object of determining the distribution and prevalence of the locust, *Chortoicetes terminifera* Walk. Other species of less economic importance were collected. Certain of the observations are noted here for future records.

The first trip occupied from 2nd to 18th December inclusive, during which time a traverse of the north-eastern pastoral areas was made, 1,230 miles being travelled altogether. The route (see map) was as follows:—From Yunta to Panaramattee, McCoy's Well, Melton, Koonamore, Curnamona, Koonamore, Waukaringa, Yunta, Winninnie, Manna Hill, Outalpa, Bulloo Creek, Broken Hill, Cockburn, Mutooroo, Lilydale, and back to Adelaide *via* Braemar, Kia Ora, and Burra.

Chortoicetes was first found at Melton. From there on, it occurred throughout the whole of this area. In three places, small swarms were discovered, two on Melton Station and one on Kia Ora Station. Elsewhere, non-gregarious individuals occurred, usually in small numbers, and generally in very localised situations. The presence of grasses (of various species) appeared to be an important feature of most of the habitats carrying *Chortoicetes*. These habitats were generally associated with creek beds or low-lying areas (known in this country as "swamps"); occasionally the species was found on hillsides or flats. Although *Chortoicetes* was found in habitats which apparently contained no grass, it never occurred in the bluebush (*Kochia*) saltbush (*Atriplex*) complex which occupies extensive areas in this country. Details of the samples of grasshoppers collected are given in Table 1, which should be studied in conjunction with the map (Fig. 1). The Table gives the results of collections made in 19 different localities. Many other areas were examined, but only those on which grasshoppers were found are recorded in the table. Altogether, 268 Acridids were collected (exclusive of those taken from swarms); of these, 25 were *Chortoicetes terminifera* and 117 were *Austroicetes* sp. The former species was represented in 8 out of 16 collections, the latter in 11 out of 16; the two species occurred together in 6 out of the 16 habitats represented in the table.

The discovery of swarms was of interest. The one found on location No. 5 occupied less than one acre; the insects were adults loosely congregating together. Their earlier history is not known; presumably they had developed from eggs laid in that vicinity by a swarm forming part of the outbreak of the previous year. If so, these adults probably correspond to "phase dissocians" of writers on other locusts. They were living on the banks of a well-defined, narrow watercourse, which were covered with a good stand of *Stipa*. The small band of gregarious nymphs found on location No. 6 were in the bed of a very shallow wide creek in which the vegetation was mostly *Bassia*. They were migrating at the time of the observations; it is not certain that they were feeding or had been feeding on the *Bassia*. The third swarm, found on Kia Ora (location 19) was more extensive. The area was a gently sloping hillside leading down to a wide but well-defined creek bed. *Chortoicetes* were present over about 10 acres. On the banks there were several small loose swarms of adults and nymphs. Many of the nymphs were undergoing transformation to the adult. In the creek bed there were several

TABLE 1.

Location Number (See Map).	Locality.	Date.	Number of Grasshoppers.				Description of Habitat.
			C. terminifera.	*Austroicetes Sp.*	Misc. Species.	Total.	
1	Panaramattee	Dec. 3rd	—	3	9	12	Swamp. Various grasses. *Echium* and other annuals.
2	Yunta	Dec. 3rd	—	3	19	22	Stony hillside. Mostly *Bassia.*
3	McCoy's Well	Dec. 4th	—	18	—	18	Swamp. Mostly *Echium.*
4	McCoy's Well	Dec. 4th	—	—	2	2	Flat. Bluebush and saltbush.
5	Melton	Dec. 5th	31*	—	—	31	Creekbed. Mostly *Stipa.*
6	Melton	Dec. 5th	42†	—	—	42	Creekbed. Mostly *Bassia.*
7	Melton	Dec. 5th	—	27	2	29	Creekbed. Mostly *Bassia.*
8	Waukaringa	Dec. 6th	5	10	10	25	Stony hillside. Bluebush and *Bassia*, apparently no grass.
9	Koonamore	Dec. 7th	1	23	2	26	Creekbed. *Echium* and various grasses.
10	Curnamona	Dec. 7th	4	8	4	16	Creekbed. *Stipa* and *Eragrostis.*
11	Teetulpa	Dec. 11th	—	—	2	2	Hillside. *Bassia.*
12	Manna Hill	Dec. 12th	1	12	23	36	Flat. *Bassia*, various grasses.
13	Manna Hill	Dec. 12th	6	3	2	11	Flat alongside creekbed; mostly *Bassia*, apparently no grass.
14	Outalpa	Dec. 12th	1	8	17	26	Creekbed. Mostly *Eragrostis.*
15	Broken Hill	Dec. 13th	1	—	10	11	Stony hillside. Mostly *Stipa.*
16	Cockburn	Dec. 16th	—	—	2	2	Flat alongside creekbed. Mostly *Stipa* and *Bassia.*
17	Mutooroo	Dec. 17th	6	—	15	21	Moist swamp, supporting fairly dense herbage grasses, *Echium*, &c.
18	Lilydale	Dec. 17th	—	—	9	9	Flat. Mostly *Bassia.*
19	Kia Ora	Dec. 18th	29*	2	—	31	Slope leading into large creekbed. *Stipa, Eragrostis, Sida,* &c.

* Taken from loose swarm of adults. † Taken from small band of gregarious nymphs.

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GOODYEAR

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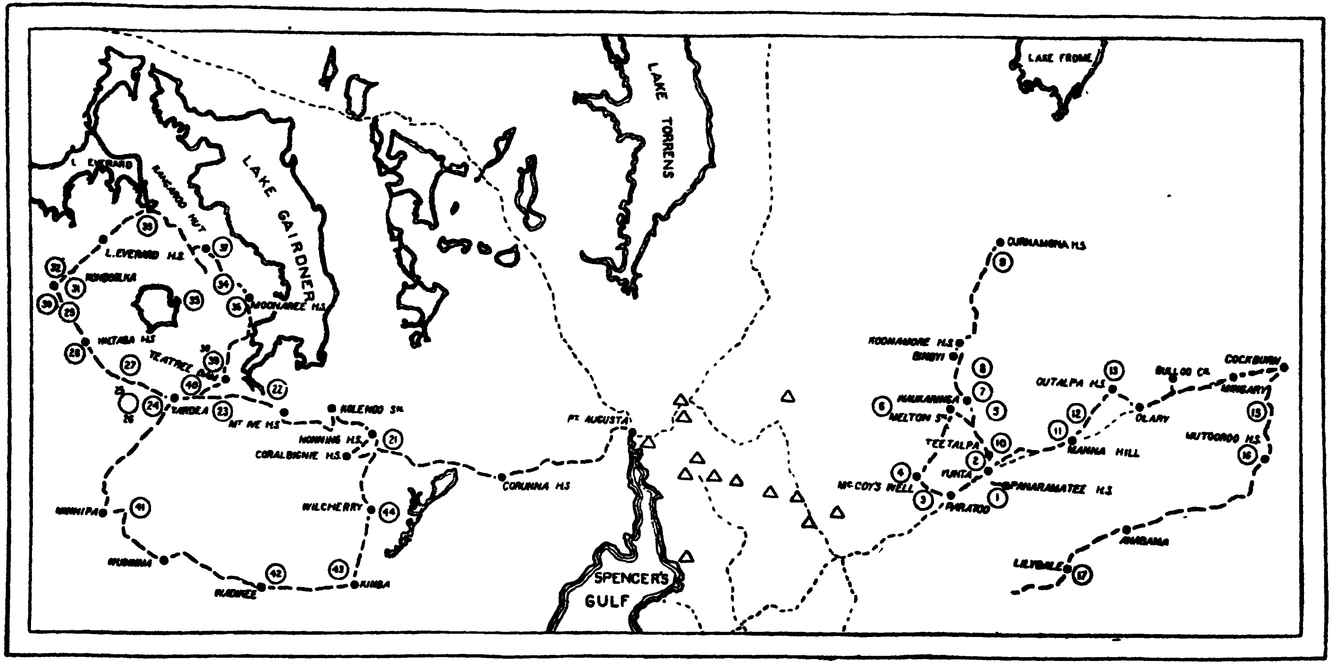
10-T1-36

TABLE 2.

Location Number (See Map.)	Locality.	Date.	Grasshoppers.				Description of Habitat.
			C. *terminifera.*	*Austroicetes Sp.*	Misc. Species.	Total.	
21	Siam	Dec. 27th	4	5	7	16	Large grass-covered flat.
22	Mount Ives	Dec. 29th	—	—	5	5	Flat country. *Acacia* and bushes.
23	Yardea	Dec. 30th	11	7	10	28	Low-lying ground near creekbed. Grasses, *Bassia*, etc.
24	Yardea	Dec. 30th	1	—	8	9	Hilly, rocky area. Some grass.
25	Yardea	Dec. 31st	1	9	2	12	Grass-covered flat.
26	Yardea	Dec. 31st	1	1	2	4	Grass-covered flat.
27	Hiltaba	Dec. 31st	—	25	1	26	Grass-covered flat.
28	Hiltaba	Dec. 31st	1	3	1	5	No record.
29	Hiltaba	Jan. 1st	1	—	10	11	Rocky outcrop. Some grass.
30	Kondoolka	Jan. 1st	—	2	11	13	Small patch of grass surrounded by " bush ".
31	Kondoolka	Jan. 1st	3	2	9	14	Small grass-covered flat.
32	Kondoolka	Jan. 1st	1	6	6	13	Small grass-covered flat.
33	Lake Everard	Jan. 3rd	—	—	1	1	Gentle slope. Mulga, bluebush and *Bassia*.
34	Moonaree	Jan. 4th	1	—	1	2	Creekbed. Grass.
35	Moonaree	Jan. 5th	1	—	—	1	Grass-covered slope at foot of hill.
36	Moonaree	Jan. 5th	2	—	5	7	Creekbed. Grass and *Bassia*.
37	Moonaree	Jan. 5th	1	—	9	10	Creekbed. Bluebush and a little grass.
38	Moonaree	Jan. 6th	—	1	6	7	Swamp. Grass.
39	Moonaree	Jan. 6th	1	—	4	5	Creekbed. Grass.
40	Yardea	Jan. 6th	—	—	3	3	Creekbed. Grass.
41	Minnipa	Jan. 7th	2	1	13	16	Reverted farm land.
42	Wudinna	Jan. 7th	1	—	5	6	Reverted farm land.
43	Kimba	Jan. 7th	3	—	3	6	Swamp at foot of hill. Mostly grass.
44	Wilcherry	Jan. 8th	1	5	8	14	Large flat creekbed. Grass and *Bassia*.



The heavy broken lines show the routes taken. The light broken lines are the principal railways. Key numbers refer to the localities described in Tables 1 and 2. The triangles represent areas where bands of *Austroicetes* nymphs and adults were observed early in October, 1935; these data have been reproduced from an unpublished report by Mr. D. C. Swan, on a visit to this area in connection with a grasshopper outbreak.

small bands (frequently less than a square chain in area, of gregarious nymphs. Between the gregarious bands nymphs and adults were found thinly scattered about. On the banks, *Stipa* and *Sida* were important. In the creek bed there was a mixed growth, with various grasses predominating. This place was revisited on 15th January. During a diligent search of the area for several miles around, only two *Chortoicetes* were seen. It is probable that the various bands of nymphs had come together to form a swarm of adults which had migrated.

During the second trip, which lasted from 26th December, to 10th January, a traverse was made of the Gawler Ranges pastoral district, and of some of the country immediately to the north and south of it. Altogether, 1,145 miles were covered. This area differed from that seen in the north-east in that there was a greater variety of habitats, and frequently each type of habitat was far more extensive. There were frequently large grassy flats covering many square miles, and equally large areas in which mulga and myall trees and bluebush and saltbush were predominant. The small localised habitats, formed by portions of creek beds and swamps which had been so prominent in the north-east, were not so common in the Gawler Ranges, particularly in that part east of Yardea. For the most part, the large, very level grassy flats which were so typical of the country east of Yardea, carried no grasshoppers. The habitats in which trees (mulga, myall, &c.) and "bush" (bluebush and saltbush, &c.) were dominant carried a few miscellaneous species but no *Chortoicetes*. In the more undulating country in which small ill-defined creek beds or swamps occurred, *Chortoicetes* was frequently found. Also, it was fairly common on the "shooty" areas in the mallee country between Minnipa and Kimba. "Shooty" country is land which has been cleared for wheat and allowed to revert. It is characterised by mallee suckers, *Stipa*, spinifex, and many annual grasses and herbs. In Table 2, details of the various collections are given. It should be studied in conjunction with the map (Fig. 1). Of the 24 habitats represented in the table, 18 of them contained *C. terminifera*, 12 contained *Austroicetes* sp., and in 9 of them both species were found together.

Altogether 234 specimens were collected; of these, 37 were *C. terminifera* and 67 were *Austroicetes* sp.

The history of the recent outbreak in the Gawler Ranges district was fairly clear. Swarms of locusts flew in to the area during the latter part of 1933. Eggs were laid during October and November. These hatched during February and March of 1934; the nymphs became adult, and laid eggs that autumn. These hatched the following August, and became adult in the spring of 1934, migrating in thousands. Thus there were two generations in this country, during the season immediately preceding the peak of the outbreak. It is probable that there were also two generations in the year before that (*i.e.*, 1932-33) in the country further north of the Gawler Ranges, *e.g.*, around Kingoonya.

It must be emphasised that these trips were in the nature of preliminary surveys, and that any conclusions drawn from them can be held only tentatively until further investigations have been conducted. On the evidence now available, there can be no doubt that areas in the Gawler Ranges formed an important intermediate breeding ground during the outbreak of *Chortoicetes*, which reached its climax in the agricultural areas of the western portion of the State during 1934. The permanent breeding grounds from which these swarms originated probably lies further north or further west. The evidence for the north-east pastoral country is not so complete. No evidence is available of autumn generations during 1933. These may have occurred. Most observers are agreed that swarms fly in from the north. Nevertheless, from the available evidence, it would seem that the north-east pastoral country does form a permanent breeding ground for *C. terminifera*, and that swarms can be initiated there.

BIFORA TESTICULATA D.C.

A NEW WEED IN SOUTH AUSTRALIA.

[W. C. JOHNSTON, R.D.A., District Agricultural Instructor.]

In the course of crop inspection duties and a search for *Romeria* hybrids in a field near Riverton, a peculiar, musty, foetid smell was apparent.

This led to a careful inspection of the plant growth with the result that an unknown white flowered plant was observed, which on being crushed gave off the foetid odour which was noticeable in the atmosphere.

IDENTIFICATION AND PLACE OF ORIGIN.

Specimens were taken and dried and forwarded to Mr. J. M. Black for identification, but owing to the fact that the plant proved to be one of the *Umbelliferae* in which ripe seeds are necessary for examination of the vittas, the identification could not be finalised. Later, ripe seeds were obtained and forwarded to Mr. Black who identified the plant as *Bifora testiculata* D.C.

The species is reported by Coste as belonging to the south of France, Syria, and North Africa and is a typical North African weed.

DESCRIPTION FROM COSTE.

An annual from 20 to 30 cms. (8in. to 12in.) in height, glabrous, strong foetid smelling; stem striate, branching; radical leave pinnatisect with tripartite segments and angular lobes, denticulate; stem leaves bipinnatisect, with divaricate sharp, linear lobes; flowers white, almost regular in umbels of 2 or 3 striate rays; umbellules with 2 or 3 flowers all fertile; involucres and involucels consisting of 1 linear bract; style recurved to level of disc; fruit didymus (two lobed with obtuse lobes) much wrinkled, indented at base and with conical projection at the summit.

ECONOMIC IMPORTANCE AND DISTRIBUTION.

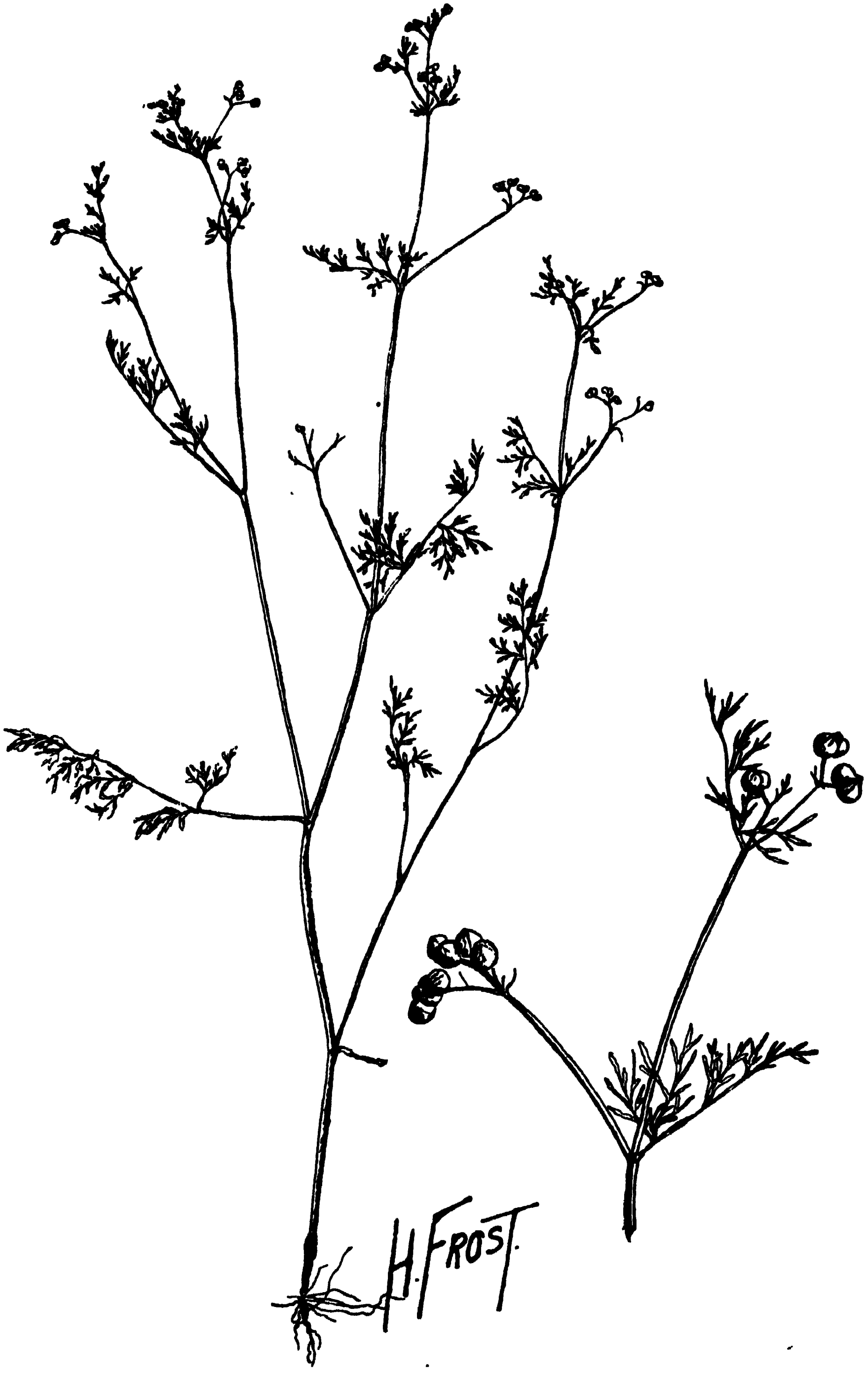
The plant has no economic features of value and it is doubtful whether it is of any importance as a weed. Its habit of growth does not appear to be such as will cause any economic loss, either in cereal crops or pastures. It is certain, however, that the objectionable odour will repel stock from feeding on it, but up to date it has not been recorded under pasture conditions.

At present the weed is known on one farm at Riverton, where it is distributed over a 70 acre field. The population in any one patch never appears to be very great and on land devoted to the cultivation of cereal crops, it is not likely to become very vigorous, certainly not to the extent of being able to compete with any free growing variety of wheat.

The writer desires to record his sincere thanks to Mr. Black for the identification of the weed and also for his ever available assistance in the classification of plants.

Bibliography: Coste, H., Flore Descriptive et Illustree de la France.

(*See illustration opposite.*)



Bifora testiculata D.C.

MANAGEMENT OF PASTURES.

COMPARING RIVER MURRAY WITH NEW ZEALAND.

[*A large number of settlers on the River Murray Swamp areas attended a Field Day, conducted by the Jervois Branch of the Agricultural Bureau, at Wood's Point, through the courtesy of Messrs. W. H. Morphett & Co., on 20th February. The following address was given by Mr. W. J. Spafford (Deputy Director of Agriculture).*]

New Zealand probably possesses the best pastures in the World, and their general excellence is largely due to the favourable natural conditions obtaining, but is also contributed to by the skilful management by the farmers. Every effort is made to keep the pastures free from weeds and to reduce to a minimum the proportion of coarser pasture plants. Weeds that cannot be grazed down are cut, and the coarser pasture plants are kept under by hard, close grazing at regular intervals.

The best of the pastures consist of well-balanced mixtures of White Clover and Perennial Rye grass, and many of them contain, as well, a noticeable proportion of Rough-stalked Meadow grass; these mixtures are kept as such by careful tending. Neglected pastures, alongside some of the best in the country, contain a mass of White Clover, but instead of having this clover well balanced with Perennial Rye grass and Rough-stalked Meadow grass, they show a luxuriant growth of Cocksfoot, Prairie grass, Red Clover, and even Tall Fescue as well as the other three pasture plants. Many of the under-grazed pastures to be seen contain a dense mass of growth as high as the fences, whereas the properly grazed ones are kept to a few inches in height.

What has become known as rotational grazing is practised, even to the extent of leaving the animals on each field for one day only at a time. On some farms the fields are grazed for one day, then rested for 10 to 14 days in the winter when the pastures are not making strong growth, whereas the same fields are grazed for one day every 4 or 5 days in the spring and summer. This rotational grazing is not practised with the idea of getting more proteinous fodder—this being unnecessary because White Clover is present in plenty—but its prime object is the maintenance of the best pasture plants in correct balance, which can only be done by very hard, close grazing at regular intervals. The grazing for short periods, and spelling the pastures for several days prevents undue fouling, reduces the risk of eating out the best types of plants, and keeps the animals in better health.

Harrowing of pastures to the extent of tearing the plants about is not very popular, but great care is taken to ensure that the droppings of animals are broken and spread about.

Except in the very richest flats of New Zealand, top dressing of the pastures is general, and judged by South Australian practices is liberal. A few proprietary mixed fertilisers are utilised for top-dressing purposes, but it is usual to apply superphosphate, and in many places lime is used as well. Large areas of pastures receive from 3cwts. to 6cwts. of superphosphate per acre per year, and some get as much as 10cwts. of lime per acre per year as well, although this amount is an unusually heavy dressing.

New Zealand farmers appear to fear a too-prolific growth of the strong-growing pasture plants such as Cocksfoot, Red Clover, and Prairie grass, or worse still the appearance in the pastures of Tall Fescue. Every effort is made by the better men to eradicate Tall Fescue, but the other strong-growing plants are kept down so that their stems do not become too coarse. This is done by utilising cattle as well as sheep on the pastures, and by hard, close grazing.

The pastures of New Zealand are grown in small fields where hard, close grazing can be carried out. Care is taken to keep down bad weeds, top-dressing is undertaken in most places, cattle and sheep are maintained on many farms to keep the good pasture plants in correct balance, and the droppings of animals are spread frequently.

Although the climate is hotter, the position as regards pastures on the reclaimed swamps of the River Murray is very similar to that of New Zealand in that the pastures make very strong, luxuriant growth in spring and summer, and because of the irrigation water they remain evergreen. Because of these similarities, it appears certain that the method of management will need to approximate closely that of New Zealand if the pastures on these reclaimed swamps are to give the high grazing returns that they are capable of giving.

When pastures are being established, the good pasture plants only should be used, such as White Clover, Cocksfoot, Perennial Rye grass and Rough-stalked Meadow grass until other more suitable pasture plants have been proved.

Holdings should be closely subdivided. Where 30 cows are being milked no field should exceed 3 acres in extent, so that the necessary hard, close grazing can be done, using 10 cows to the acre for 1 day, or if sheep are used to be able to put 100 sheep per acre for 1 day. Although the necessity for the control of Tall Fescue does not exist on the reclaimed swamps as it does in New Zealand, *Papsalum dilatatum* is spreading rapidly to the exclusion of better grazing plants. Small fields, hard grazing, and the encouragement of clover are essential if this plant is to be kept within reasonable bounds. Couch grass (*Cynodon dactylon*) is also extending, and where this grass is present in quantity, similar good methods of management are essential.

If the pastures are grazed properly, edible weeds will be eradicated. or at all events kept in check, but all non-edible weeds should be removed.

Top-dressing the pastures with superphosphate every year, and with lime occasionally, should be carried out. The good pastures are easily worth from 3cwts. to 5cwts. of superphosphate per acre per year, and the equivalent of 10cwts. of slaked lime every 3 or 4 years. Top-dressing with phosphates and lime is not only necessary to promote full growth of pasture, but is essential if enormous numbers of livestock are to be grazed on these areas for several years in succession to maintain the animals in good health. The constant removal of large amounts of phosphorus and lime in the milk and meat produced by these pastures quickly leads to a shortage, which shows itself in the ill-health of the animals, lessened growth of young stock, and lowered returns from all animals being grazed.

Cattle and sheep should be maintained on the holdings to keep the pastures in the best of condition. Where cattle are the chief activity, some sheep should also be carried, and where sheep have pride of place, some cattle, perhaps beef cattle, should be fattened.

The droppings of animals should be spread about the fields fairly frequently, using for the purpose light harrows or some such contraption as a piece of cyclone fencing weighted with timber on the back edge. Where twitch grasses, such as Couch grass (*Cynodon dactylon*) and Water Couch (*Paspalum distichum*) are present, or where *Paspalum dilatatum* has a hold, harrowing with an implement heavy enough to tear the sod will do much good.

GREEN MANURING.

[By N. R. QUINN (Assistant Horticultural Instructor).]

The growth of green crops and their incorporation with soil as green manure are not a new practice; the ancient Romans found that by preliminary ploughing under of leguminous crops, the succeeding main crops benefitted considerably. It is well known that in the case of a virgin soil, carrying a natural cover of grass, the organic matter or humus content of the soil is maintained at a more or less constant level. It is also known that when such a soil is ploughed and cultivated over a period of years, large quantities of organic matter are lost; sandy soils are probably more subject to such humus depletion than are heavy soils.

The loss of organic matter interferes with the physical condition of a soil, and and it will be noticed after a period of years from the breaking of virgin soil, that the soil becomes less tractable. Sandy types of soil become loose and unstable, whilst the heavier clay type soils become hard and relatively impervious to moisture. These physical changes come about through the depletion of the original organic matter, the decomposed vegetable matter or humus having a binding effect on a sandy soil, and an ameliorating action on the fine particles of a clay soil.

With the decomposition of vegetable matter in a soil, weak humid acids are formed, and these acids, reacting on the fixed mineral plant foods in the soil assist in transforming such fixed unavailable plant foods into forms which the growing crops can readily assimilate. Under certain specific conditions, particularly in the United States of America, it is sometimes customary to maintain orchards in sod, but under Australian conditions, where rainfall may be an important limiting factor to growth and cropping, this system of fruit tree culture is not always desirable. Furthermore, the minute bacteria that inhabit the soil, and transform decaying vegetable matter into plant foods, require light and air, and to provide them with these essentials some cultivation is necessary.

Apart from consideration of the effect of green cropping on soil texture and the supply of plant food, there are other beneficial effects to be derived from the practice, viz.:—

(1) The prevention of soil erosion on a hillside during heavy winter rains. It will be found that a growing green crop sown across a slope as far as practicable will retard the rush of surface water.

(2) In many orchards a high water table may exist during the winter months, and in such instances this very undesirable condition may be reduced to a considerable extent by planting a green manure crop over the affected area. The volume of water transpired by a winter growing green crop is enormous, and from this viewpoint such a crop may be regarded as an excellent drainage system.

There are many kinds of plants which the orchardist may use for green cropping. Generally, the legumes should be given first preference, beans and peas being most commonly used. The chief advantage of leguminous green crops lies in their well-known capacity of fixing atmospheric nitrogen. One other advantage the legume has over the non-legume is that the former generally goes through the process of decomposition more readily when ploughed under.

The non-legumes that are popular for sowing as green crops are barley and rye. These two cereals have not the capacity of adding to the soil's nitrogen supply from the air, as is the case with legumes, but if the seed is sown thickly, a large bulk of organic matter for ploughing under will be provided. It should be borne in mind that early sowing of a green crop is essential; often the harvesting of the main orchard crop will not have been completed at the optimum planting time, and under such circumstances, the best practice is to green crop in alternate lanes in alternate years, thus eliminating undue interference with harvesting operations.

The soil in a well cultivated orchard requires very little preparation prior to sowing of a green crop. The usual method is first to loosen the soil, with the orchard cultivator, in the rows to be sown. The seed may be broadcast, and generally superphosphate is applied with it. Amongst trees of a spreading nature the orthodox seed drill approaches closely to the trees with difficulty, and the result is that only a narrow strip in the centre of each row is sown. In such cases, it is usual to broadcast 2cwts. of superphosphate to each actual acre to be sown, and then to broadcast 80lbs. of tick beans or 70lbs. of peas per acre and cover by light harrowing. The green crop should be sown, if possible, at the end of February or in early March, and this early sowing may not be practicable in the case of the legume without the help of an irrigation. Barley sown at the rate of 60lbs. per acre will be found to be a suitable crop under relatively dry conditions.

The reason for sowing early is to make it possible for the crop to produce as much growth as possible before the soil becomes too cold, for it is necessary to plough the crop under some time before bud-burst of the fruit trees or vines. In the case of a leguminous crop it has been found that there is an interval of from three to five weeks after turning under of a green crop before nitrogen becomes available as plant food. During the period of decomposition of a green crop, there is a definite deficiency of available nitrogen in the soil, and if the crop has, of necessity, been turned under late, it is advisable to add some artificial nitrogen to accommodate the demands of the main fruit crop during this period. Leguminous crops respond very noticeably to a preliminary dressing of lime on soils that are inclined to be sour.

Usually, when a leguminous crop begins to flower, ploughing under has been deferred a little too long, and further, under dry conditions, the green crop has been permitted to dry out the soil, very often to the disadvantage of the fruit trees and at the expense of ready decomposition of the green crop. A green crop ploughed under in a dry soil may do harm in that it will cause the soil to be kept too open, with consequent rapid loss of soil moisture reserves.

The advantage of early sowing of a green crop in orchards that are heavily clothed with "soursob" during the winter months will be appreciated, as the crop will probably have made good growth during the warmer months, and later be in a position to withstand the competition of soursob.

There are two main methods of turning under the green manure crop:—(1) The crop may be rolled down and then disced under. This method is usually practised when it is not possible to plough very deeply. (2) When the soil is deep and of a friable nature the mouldboard plough is the best implement to use.

The usual practice is to use a single-furrow plough with a disc coulter attached and a drag chain slung from the "off-side" swing bar back on to the beam of the plough; some slack is permitted in the chain to catch the crop and drag it into the furrow.

Green manuring is a practice that should be carried out regularly, as it takes years to build up a soil that has become deficient in organic matter. At first, the benefit may not be readily appreciated, but after a few years of regular green cropping the improvement in soil fertility will usually become so marked as to convince even the complete disbelievers.

PURE BRED COWS COMPLETED OFFICIAL TEST

JUNIOR TWO-YEAR-OLDS—

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
Not allotted	Glen Ewin Morn's May Blossom	J. McEwin, Houghton	Jersey	15/10/34
43544	Crofton Morning Star	J. McEwin, Houghton	“	29/10/34
Not allotted	Cudlee Creek Leonie	J. McEwin, Houghton	“	2/10/34
“	Murray Glen Sylvia Beets	C. J. Morris, Monteith	Friesian	8/3/35
“	Murray Glen Inka Ashlyn	C. J. Morris, Monteith	“	22/12/34
“	Para Wirra Sunray	J. H. Dawkins, Gawler	Jersey	6/10/34
“	Wybalena Ama	P. J. A. Braendler, Ambleside	A.I.S.	4/10/34
“	Kirami Sparkling Stella	R. J. Laing, Gumeracha	Jersey	26/10/34
“	Crofton Queen Kate	H. & A. Bohme, Balhannah	“	18/11/34
“	Glenowie Princess Mary	H. Mountstephen, Monteith	Friesian	14/11/34
43188	Brinkworth Regina	C. C. T. Ottens, Brinkworth	Jersey	18/3/35
Not allotted	Kyby Rosalie	Government Farm, Kybybolite	Ayrshire	9/10/34
43612	Delma Blonde's Lotus	E. W. Pfitzner, Eudunda	Jersey	23/2/35
Not allotted	Para Vale Columbine 2nd	A. J. Marrett, Saddleworth	“	12/3/35
“	Spring Vale Dulcima Inka	Compton Calf Club, Mount Gambier	Friesian	2/3/35
“	Rivington Winnie	J. W. Crompton, Victor Harbour	Jersey	8/3/35
“	Morella Trilby Olive 2nd	H. R. Walsh, Mount Barker	“	29/11/34
“	Hampden Blonde's Beauty	J. A. J. Pfitzner, Hampden	“	3/12/34
“	Lakeland Marchette	H. R. Walsh, Mount Barker	“	30/1/35
“	Para Wirra Duchess	J. H. Dawkins, Gawler	“	15/1/35
“	Tabbagong Dairymaid 16th	J. M. Irwin, Mount Barker	A.I.S.	1/10/34
“	Rivington Hazel	J. W. Crompton, Victor Harbour	Jersey	16/3/35
“	Scrub View Dulcie	A. B. A. Weckert, Brinkworth	“	10/1/35
“	Morella Thornflower	H. R. Walsh, Mount Barker	“	29/11/34
“	Alexandra Buttercup	A. Kelly, Milang	“	22/10/34
“	Para Vale Daphne	A. J. Marrett, Saddleworth	“	2/12/34
“	Wooroora Soeurette	A. B. Sieber, Eudunda	“	27/9/34
41116	Morella Golden Beauty	H. R. Walsh, Mount Barker	“	24/11/34
44717	Kirami Jennifer's Princess	R. J. Laing, Gumeracha	“	18/3/35
Not allotted	Ontario Daphne	T. B. Brooks, Clarendon	“	26/2/35
“	Lakeland Berelette	H. R. Walsh, Mount Barker	“	17/12/34
Not allotted	Long Flat Lucy 3rd	Mrs. A. H. Spackman, Long Flat	A.I.S.	12/1/35
42633	Wooroora Blonde Morn	A. B. Sieber, Eudunda	Jersey	26/12/34
Not allotted	Alexandra Lorna	A. Kelly, Milang	“	10/11/34
“	Para Wirra Maisie	J. H. Dawkins, Gawler	“	10/10/34
43586	Cumberland Sylvia	L. W. Frost, Saddleworth	“	21/2/35
Not allotted	Dunleith Millie 2nd	Dunleith Past. Co., Ashbourne	A.I.S.	27/8/34
“	Kyby Bell	Government Farm, Kybybolite	Ayrshire	14/1/35
“	Hampden Sultane Jest	J. A. J. Pfitzner, Hampden	Jersey	9/11/34
“	Tuela Sesbania	F. Coleman, Saddletorth	“	29/10/34
44267	Hampden Gamboge's Sybil	J. A. J. Pfitzner, Hampden	“	8/3/35
Not allotted	Kyby Gracious	Government Farm, Kybybolite	Ayrshire	6/10/34
“	Morella Damsel 7th	H. R. Walsh, Mount Barker	Jersey	1/2/35
“	West Kilbride Welcome	Insp.-General Hospitals, Northfield	Ayrshire	2/11/34
“	Lakeland Satinette	H. R. Walsh, Mount Barker	Jersey	11/2/35
“	Northfield Pride 2nd	Insp.-General Hospitals, Northfield	A.I.S.	10/12/34
“	Roseworthy Princess 53rd	Agricultural College, Roseworthy	Jersey	8/12/34
43579	Cumberland Beauty	L. W. Frost, Saddleworth	“	14/2/35
Not allotted	Ninyeri Pearl	E. L. Goode, Narrung	“	21/3/35
“	Pembroke Fussy Lotus	Mrs. C. W. Ansell, Bolivar	“	12/11/34
“	Willowvale Colantha Triumph	Calf Club, Compton	Friesian	27/9/34
“	Lakeland Moquette	H. R. Walsh, Mount Barker	Jersey	20/2/35
“	Inman Countess	G. V. Rogers, Inman Valley	“	16/11/34
“	Pembroke Della	Mrs. C. W. Ansell, Bolivar	“	19/4/35
“	Lakeland Sybilette	H. R. Walsh, Mount Barker	“	20/2/35
“	Pembroke Dahlia	Mrs. C. W. Ansell, Bolivar	“	16/3/35
“	Kyby Snowdrift	Government Farm, Kybybolite	Ayrshire	8/10/34
“	Northfield Janet Sunflower 2nd	Insp.-General Hospitals, Northfield	A.I.S.	2/10/34
“	Pembroke Lotus Lily	Mrs. C. W. Ansell, Bolivar	Jersey	22/3/35
“	Glen Belah Pansy	E. O. Hancock, Andrews	Ayrshire	3/8/35
“	Pembroke Maiden	Mrs. C. W. Ansell, Bolivar	Jersey	16/4/35
“	Morella Belle 7th	H. R. Walsh, Mount Barker	“	26/4/35
“	Pembroke Daphne	Mrs. C. W. Ansell, Bolivar	“	29/4/35
“	Pembroke Fondant	Mrs. C. W. Ansell, Bolivar	“	23/5/35

BETWEEN JULY 1st, 1935, AND DECEMBER 31st, 1935.

Age at Calving.			Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Y.	M.	D.	Lbs.	%	Lbs.			
Butterfat Standard, 230lbs.								
2	1	25	8,615	5·10	439·30	273	Werribee Masterman	—
2	1	15	8,073	5·17	417·31	273	Glen Ewin Morn's Starbright	—
2	0	16	7,144½	5·67	405·15	273	Producer 3rd of Dalebank	—
2	3	24	9,804	4·10	401·75	273	Murray Glen Griselda Beets	—
2	4	1	10,771½	3·55	381·98	273	Murray Glen Griselda Beets	—
2	1	6	6,009	6·00	360·76	273	Para Wirra Collegian	—
2	1	19	9,096	3·72	338·27	273	Wangara Sunflower's Limelight	—
1	11	26	5,922	5·70	337·48	273	Glen Ewin Molly's Starbright	—
2	2	2	6,082½	5·41	329·21	273	Glen Ewin Morn's Starbright	—
2	3	13	7,185	4·22	303·19	240	Glenowie Netherland Prince 2nd	Dried off
1	11	14	5,088	5·90	300·26	273	Havec Star	—
2	0	18	7,146	4·05	289·60	273	Gowrie Park Leyland	—
2	1	3	5,359½	5·32	285·03	273	Bellefaire Blonde's Aristocrat	—
2	0	25	4,626	6·09	281·68	273	Para Wirra Percy	—
1	9	24	6,172½	4·55	280·83	273	Spring Vale Pietertje	—
1	11	22	5,869½	4·78	280·76	273	Baxter of Banyule	—
2	3	18	5,099	5·47	278·86	273	Anemone's Chief of Morella	—
1	10	13	4,671	5·86	273·66	273	Bellefaire Blonde's Aristocrat	—
1	10	6	4,770	5·73	273·29	240	Demetrius of Tuela	Sold
2	3	17	4,479½	5·94	266·02	273	Para Wirra Collegian	—
2	2	8	6,183	4·26	263·59	273	Park View Reward 2nd	—
1	11	28	4,980	5·28	262·81	240	Baxter of Banyule	Sold
2	5	28	4,546½	5·69	258·54	273	Scrub View Twylish Lad	—
1	9	18	4,528½	5·69	257·74	273	Anemone's Chief of Morella	—
2	3	18	5,096	5·05	257·38	273	Hampden Queen's Repeater	—
2	0	16	6,239	4·12	256·99	273	Para Wirra Cherry Pylon	—
1	7	23	4,887	5·24	256·12	273	Soeurette's Fountain Lad	—
2	1	6	4,105½	6·20	254·58	273	Austral Park Gold Stem	—
2	0	9	4,512	5·59	252·21	273	Kangaroo Flat Merry Mike	—
1	7	9	4,888½	5·13	250·76	273	Brighton King 75th	—
1	8	6	4,867½	5·15	250·56	273	Weribee Masterstroke	—
2	4	28	6,784½	3·67	248·85	273	Long Flat Madge Gladiator	—
2	5	15	4,077	6·10	248·70	273	Bellefaire Blond's Signal	—
2	3	26	4,375½	5·61	245·49	273	Hampden Queen's Repeater	—
1	7	16	4,485½	5·43	243·72	273	Para Wirra Collegian	—
1	6	5	4,653	5·28	243·15	273	Para Vale Prince 2nd	—
2	1	8	6,712½	3·60	241·43	273	East View Sultan	—
			7,207½	3·64	262·19	300		
2	0	24	5,517	4·37	241·27	273	Gowrie Park Scottish Dandy	—
1	8	16	4,012½	5·79	232·14	273	Woodside Agatha's Gamboge	—
1	6	26	3,945½	5·77	227·57	273	Hampden Winsome King	—
1	11	11	3,685½	6·07	223·64	273	Woodside Agatha's Gamboge	—
1	11	28	5,065½	4·33	219·57	273	Gowrie Park Scottish Dandy	—
1	10	20	4,980	4·36	217·09	273	Anemone's Chief of Morella	—
2	2	7	5,222	4·15	216·82	273	Oakbank Classical	—
2	4	18	3,045	7·05	214·66	240	Werribee Masterstroke	Sold
2	3	9	5,846	3·66	214·25	273	Northfield Janet's Success	—
2	4	14	3,679½	5·72	210·53	273	Roseworthy Pretty Duke	—
1	9	22	3,865½	5·06	195·67	273	Para Vale Prince 2nd	
1	3	19	3,378	5·74	193·84	273	Ninyeri Chief	—
2	3	1	4,050	4·69	189·77	240	Twylish of Para Wirra	Withdrawn
1	5	9	4,756½	3·88	184·47	273	Glenowie Beets Posch	—
1	9	1	3,615	4·87	176·12	210	Pella Masterpiece	Sold
1	7	26	3,765	4·63	174·35	210	Balaklava Rhodesian's Repulse	Owner ceased testing
2	5	5	2,640	6·51	171·77	180	Pembroke Twylish	Owner ceased testing
1	11	13	3,135	5·32	166·94	210	Werribee Masterstroke	Sold
1	6	29	2,775	6·00	166·47	210	Dalebank Mercedes Duke	Owner ceased testing
1	10	22	3,688½	4·51	166·39	273	Gowrie Park Leyland	—
2	0	24	4,003	3·85	153·93	273	Northfield Janet Royal	—
1	7	10	2,835	5·09	144·24	210	Dalebank Mercedes Duke	Owner ceased testing
2	0	16	3,165	4·22	133·44	120	Kyby Robin	Sold
1	8	6	2,535	4·83	122·35	150	Dalebank Mercedes Duke	Owner ceased testing
2	2	25	2,160	5·05	109·10	150	Anemone's Chief of Morella	Sold
1	8	5	2,055	4·97	102·18	120	Dalebank Mercedes Duke	Owner ceased testing
1	11	22	2,055	4·96	101·98	120	Pembroke Majestic	Owner ceased testing

PURE-BRED .COWS COMPLETED

Herd Book No.	Name of Cow.	Owner and Address.	Vreed.	Calved.
				JUNIOR TWO-YEAR-OLDS—
Not allotted	Pembroke Jean	Mrs. C. W. Ansell, Bolivar	Jersey	14/5/35
"	Kyby Butterfly	Government Farm, Kybybolite	Ayrshire	17/7/35
"	Kyby Resolve	Government Farm, Kybybolite	"	6/6/35
"	Lallawa Barbara's Musician	J. F. Dodd, Meningie	Jersey	10/8/35
"	Pembroke Valda	Mrs. C. W. Ansell, Bolivar	"	28/5/35
"	Alexandra Duchess	A. Kelly, Milang	"	8/5/35
"	Dunleith Violet 2nd	Dunleith Pastoral Co., Ashbourne	A.I.S.	17/10/35
"	Dalkey Princess Harmony	G. D. Oster, Balaklava	Jersey	8/6/35
"	Tuela Nemophila	F. Coleman, Saddleworth	"	7/8/35
"	Roseworthy Princess 57th	Agricultural College, Roseworthy	"	2/10/35
"	Hampden Bonaparte Sybil	J. A. J. Pfitzner, Hampden	"	6/7/35
				SENIOR TWO-YEAR-OLDS—
40141	Gunawah Postmark	E. W. Pfitzner, Eudunda	Jersey	26/3/35
Not allotted	Para Wirra Cherry 2nd	J. H. Dawkins, Gawler	"	4/3/35
"	Glen Ewin White Rose	J. McEwin, Houghton	"	1/10/34
42630	Wooroora Blonde Bell	A. B. Sieber, Eudunda	"	24/2/35
40626	Lanacoona Carnation Kelly	C. E. Verco, Mount Compass	"	21/11/34
42632	Wooroora Blonde Lotus	A. B. Sieber, Eudunda	"	22/2/35
Not allotted	Hampden Olive's Ruby	J. A. J. Pfitzner, Hampden	"	26/10/34
"	Anama Alcartra Judy	W. Hawker, Clare	Friesian	11/3/35
41500	Para Vale Lady McEwin 2nd	A. J. Marrett, Saddleworth	Jersey	10/2/35
42631	Wooroora Blonde Duchess	A. B. Sieber, Eudunda	"	26/2/35
Not allotted	Para Wirra Janet	J. H. Dawkins	"	17/12/34
42086	Sweet Haven Enchantress	J. M. Bray, Langhorne's Creek	"	29/9/34
41499	Para Vale Fairy Queen	A. J. Marrett, Saddleworth	"	12/10/34
Not allotted	Ontario Poppy	T. B. Brooks, Clarendon	"	1/3/35
"	Ontario Lady Marge	T. B. Brooks, Clarendon	"	17/1/35
8219	The Laurels Handsome	P. J. A. Braendler, Ambleside	A.I.S.	1/11/34
Not allotted	Rivington Petrel	J. W. Crompton, Victor Harbour	Jersey	13/2/35
42237	Timbungalung Island Larkspur	Mrs. A. Bowman, Meningie	"	3/1/35
Not allotted	Auldearn Lady Columbine	Mrs. D. G. Steven, Kooringa	"	15/12/34
4197	Glenlea Jean	E. T. Vinall, Brighton	Guernsey	28/10/34
39441	Crofton Souvenier	H. & A. Bohme, Balhannah	Jersey	19/1/35
Not allotted	Long Flat Mermaid 4th	Mrs. A. H. Spackman, Long Flat	A.I.S.	11/3/35
26526	Kyby Rosemary	Government Farm, Kybybolite	Ayrshire	27/9/34
Not allotted	Hazelbrook Delma	J. N. Reid, Oakbank	"	29/11/34
"	Glenlea Maida	E. T. Vinall, Brighton	Guernsey	21/10/34
5415	Northfield Limelight's Flirt 3rd	Insp.-General Hospitals, Northfield	A.I.S.	7/10/34
8284	Liberton Trilby 3rd	W. Nitschke & Son, Littlehampton	"	1/1/35
39501	Delma Blonde's Signpost	E. W. Pfitzner, Eudunda.	Jersey	15/5/35
44391	Inman Nola	G. V. Rogers, Inman Valley	"	13/2/35
Not allotted	Pembroke Vanity	Mrs. C. W. Ansell, Bolivar	"	21/6/35
"	Dunleith Favorite	Dunleith Pastoral Co., Ashbourne	A.I.S.	20/4/35
				JUNIOR THREE-YEAR-OLDS—
Not allotted	Murray Glen Beets Superior	C. J. Morris, Monteith	Friesian	23/12/34
34481	Sweet Haven Mercedes Carnation	H. A. Follett, Langhorne's Creek	Jersey	18/10/34
Not allotted	Glenowie Colantha May	H. Mountstephen, Monteith	Friesian	18/1/35
34477	Lakeland Fayette	H. A. Follett, Langhorne's Creek	Jersey	18/10/34
39079	Brinkworth Eclipse	C. C. T. Ottens, Brinkworth	"	12/3/35
40155	Hampden Noble's Guitar	J. A. J. Pfitzner, Hampden	"	3/12/34
34482	Sweet Haven Mercedes Viola	H. A. Follett, Langhorne's Creek	"	8/10/34
Not allotted	Morella Damsel 6th	H. R. Walsh, Mount Barker	"	12/12/34
"	Tuela Briar Rose	F. Coleman, Saddleworth	"	6/12/34
41503	Para Wirra Eileen 5th	J. H. Dawkins, Gawler	"	19/12/34
Not allotted	Glen Ewin Morn's Mayflower	J. McEwin, Houghton	"	25/10/34
"	Kirami Lady Grey	R. J. Laing, Gumeracha	"	22/2/35
"	Palpara Audrey	Mrs. C. E. Mayger, Kapunda	"	3/11/34
"	Para Wirra May	J. H. Dawkins, Gawler	"	9/4/35
38618	Woodside Lily's Bouquet	E. W. Pfitzner, Eudunda	"	12/10/34
Not allotted	Glenowie Princess Pauline	H. Mountstephen, Monteith	Friesian	15/12/34
44805	Lallawa Carnation 5th	J. F. Dodd, Meningie	Jersey	11/11/34
40157	Hampden Pretty May	A. B. A. Weckert, Brinkworth	"	26/1/35

OFFICIAL TEST—*continued.*

Age at Calving.			Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Y.	M.	D.	Lbs.	%	Lbs.			
Butterfat Standard, 230lbs.—*continued.*								
1	10	14	1,815	5·18	93·99	120	Twylish of Para Wirra	Owner ceased testing
2	3	14	1,815	5·07	92·08	150	Gowrie Park Leyland	Dried off
2	0	9	1,935	3·91	75·74	150	Gowrie Park Leyland	Dried off
1	9	19	1,365	5·52	75·30	60	Carrickalinga Bango	Withdrawn
1	8	18	1,215	5·51	66·94	90	Twylish of Para Wirra	Owner ceased testing
2	2	29	1,170	5·43	63·49	90	Hampden Queen's Repeater	Withdrawn
2	3	3	1,455	3·71	53·99	60	Maylad 2nd of Illawirra	Withdrawn
1	8	27	810	5·75	46·61	60	Hampden Mariposa's Prince	Withdrawn
1	8	21	810	4·69	37·98	30	Tuela Hercules	Withdrawn
2	1	11	630	4·39	27·66	30	Roseworthy Pretty Duke	Sold
1	10	15	360	3·88	13·97	30	Bellefaire Bonaparte's Bonton	Exemption
Butterfat Standard, 250lbs.								
2	11	28	7,779	6·64	516·50	273	His Grace	—
2	6	23	6,859½	5·30	363·70	273	Banyule Pylon	—
2	8	17	6,451½	5·51	355·51	273	Brucevale Lord Fancy Starbright	—
2	8	19	5,733	6·00	344·11	273	Bellefaire Blonde's Signal	—
2	8	13	6,022½	5·61	337·71	273	Melvin Noble 2nd	—
2	8	26	6.036	5·53	333·96	273	Bellefaire Blond's Signal	—
2	8	1	6,006	5·52	331·68	273	Bellefaire Blonde's Aristocrat	—
2	6	3	8,694	3·67	319·37	273	Totara Pontiac Dainty Boy	—
2	10	5	6,559½	4·86	319·12	273	Para Wirra Cherry Pylon	—
2	9	1	5,142	5·98	307·74	273	Bellefaire Blonde's Signal	—
2	6	17	6,390	4·81	307·39	240	Banyule Pylon	†
2	9	23	7,531½	4·06	305·79	273	Dalebank Producer 8th	—
2	7	4	6,505½	4·68	304·23	273	Para Wirra Cherry Pylon	—
2	8	12	5,527½	5·44	300·73	273	Dalebank Viola's Duke	—
2	7	1	4,909½	6·02	296·00	273	Dalebank Viola's Duke	—
2	11	27	8,064	3·67	295·86	273	Prince Henry of Fairfield	—
2	6	11	6,247½	4·70	293·66	273	Baxter of Banyule	—
2	8	4	4,888½	5·64	275·72	273	Timbungalung Butter King	—
2	9	22	5,566½	4·86	270·27	273	Para Wirra Cherry Pylon	—
2	10	5	5,010	5·30	265·48	273	Glenlea Hilda's Valour 2nd	—
2	9	1	4,791	5·33	255·48	273	Butter King of Pella	—
2	7	16	6,087	4·14	251 78	273	Wangara Ruth's Limelight	—
2	11	20	5,448	4·50	245·16	273	Ida's Laird of Gowrie Park	—
2	11	15	5,667	4·03	228·32	273	Hazelbrook Progress	—
2	9	19	3,874½	5·47	212·06	273	Glenlea Hilda's Valour 2nd	—
2	8	28	6,445	3·15	202·78	273	Melba's Limelight of Wangara	—
2	9	20	4,605	4·32	199·03	240	Viscount 2nd of East View	Withdrawn
2	9	23	2,910	5·67	164·98	150	Bellefaire Blonde's Signal	Sold
2	7	7	2,100	5·04	105·81	120	Wooroora King's Admiral	Owner ceased testing
2	10	22	1,695	6·18	104·72	90	Twylish of Para Wirra	Owner ceased testing
2	7	6	2,130	3·91	83·34	90	East View Sultan	Sold
Butterfat Standard, 270lbs.								
3	0	6	12,171	4·88	594·52	273	Murray Glen Griselda Beets	—
3	0	20	7,810½	5·78	451·26	273	Dalebank Mercedes Duke	—
3	2	3	11,524½	3·88	447·01	273	Glenowie Colantha Netherland	—
3	5	19	8,069	5·43	438·18	273	Timbungalung Airboy	—
3	0	5	7,560	5·75	434·77	273	Havec Star	—
3	2	21	6,642	6·41	425·74	273	Bellefaire Blonde's Aristocrat	—
3	2	17	7,560	5·55	419·83	273	Dalebank Mercedes Duke	—
3	3	21	7,913	5·25	415·08	273	Morella Anemone's Chief 5th	—
3	3	16	6,566	6·09	400·10	273	Hampden Winsome King	—
3	4	16	7,221	5·20	375·67	273	Banyule Pylon	—
3	1	5	5,670	6·42	364·18	273	Werribee Masterman	—
3	1	7	6,177	5·57	344·20	273	Timbungalung Airboy	—
3	2	2	5,406	5·88	317·78	273	Wooroora King's Hero	—
3	1	11	4,845	6·51	315·62	210	Para Wirra Percy	Sold
3	4	19	6,069	5·12	310·65	273	Anemone's Lily Oxford	—
3	4	25	8,181	3·73	305·43	273	Glenowie Netherland Prince 2nd	—
3	0	27	5,718½	5·12	292·99	273	Dalebank Chieftan 2nd	—
3	4	17	4,797	6·05	290·00	273	Hampden Olive's King	—

PURE-BRED COWS COMPLETED

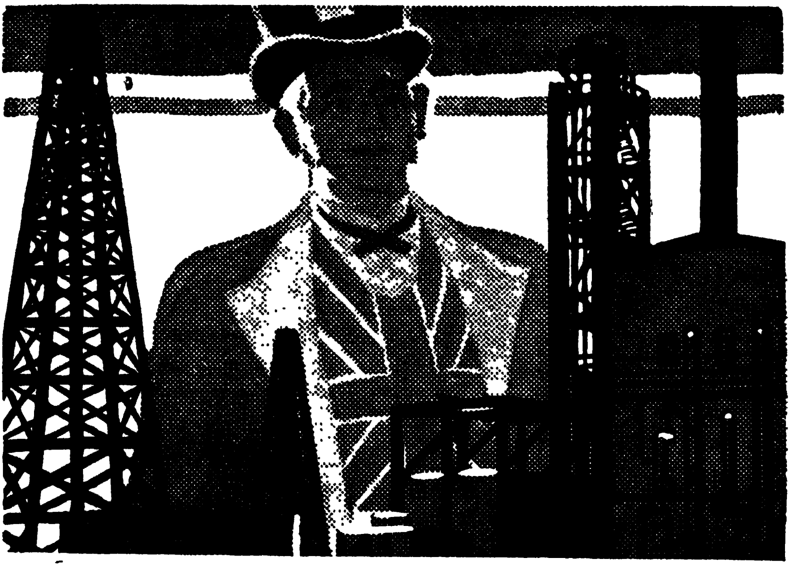
Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
JUNIOR THREE-YEAR-OLDS—				
Not allotted	Palpara Bonny	Mrs. C. E. Mayger, Kapunda	Jersey	10/12/34
5424	Long Flat Lucy 2nd	Mrs. A. H. Spackman, Long Flat	A.I.S.	9/1/35
Not allotted	Kyby Ena	Government Farm, Kybybolite	Ayrshire	13/1/35
"	Lallawa Producer's Mystery	J. F. Dodd, Meningie	Jersey	28/9/34
Not allotted	Northfield Lucy	Insp.-General Hospitals, Northfield	A.I.S.	2/1/35
8493	Northfield Prince's Gem	Insp.-General Hospitals, Northfield	"	17/1/35
Not allotted	Kiama Primrose 2nd	E. & A. Nicholls, Woodville	"	28/3/35
8487	Northfield Janet's Sunflower	Insp.-General Hospitals, Northfield	"	16/2/35
Not allotted	Lallawa Chieftain's Carnation	J. F. Dodd, Meningie	Jersey	2/4/35
"	Channel View Sister Grey	Mrs. A. M. Carruthers, Narrung	"	18/1/35
8494	Northfield Royal's Dora	Insp.-General Hospitals, Northfield	A.I.S.	12/1/35
8488	Northfield Limelight's Duchess	Insp.-Gemeral Hospitals, Northfield	A.I.S.	2/2/35
Not allotted	Kyby White Rose	Government Farm, Kybybolite	Ayrshire	12/3/35
"	Para Vale Millie 3rd	A. J. Marrett, Saddleworth	Jersey	24/8/35
SENIOR THREE-YEAR-OLDS—				
Not allotted	Murray Glen Griselda Burkeyje	C. J. Morris, Monteith	Friesian	16/1/35
"	Para Wirra Dulcie 2nd	J. H. Dawkins, Gawler	Jersey	10/2/35
34591	Glen Ewin Rosebud	O. H. Woodward, Gilles Plains	"	29/9/34
34690	Wooroora Waffles	A. B. Sieber, Eudunda	"	24/3/35
41502	Para Wirra Beauty	J. H. Dawkins, Gawler	"	4/2/35
5372	Kiama Robin 3rd	E. & A. Nicholls, Woodville	A.I.S.	3/2/35
Not allotted	Para Wirra Cherry's Snowflake	J. H. Dawkins, Gawler	Jersey	7/12/34
34689	Wooroora Royal Gem	A. B. Sieber, Eudunda	"	21/2/35
35295	Austral Park Gold Tip	H. R. Walsh, Mount Barker	"	23/12/34
35296	Austral Park Goldora	W. A. Mueller, Ambleside	"	4/10/34
5417	Northfield Royal Blossom	Insp.-General Hospitals, Northfield	A.I.S.	10/10/34
Not allotted	Para Vale Rose	A. J. Marrett, Saddleworth	Jersey	11/11/34
34638	Delma Doris	R. J. Laing, Gumeracha	"	31/3/35
40130	Gum Hill Beauty	P. O. Schutz, Eudunda	"	26/1/35
4020	Glenowie Flower Patch	H. Mountstephen, Monteith	Friesian	—/4/35
41385	Ontario Pansy	T. B. Brooks, Clarendon	Jersey	12/3/35
8491	Northfield Primrose	Insp.-General Hospitals, Northfield	A.I.S.	22/2/35
Not allotted	Lallawa Twylish Carnation	J. F. Dodd, Meningie	Jersey	18/1/35
41386	Ontario Prosperity	T. B. Brooks, Clarendon	"	24/2/35
Not allotted	Lallawara Barbara Boronia	J. F. Dodd, Meningie	"	15/1/35
JUNIOR FOUR-YEAR-OLDS—				
Not allotted	El Rimal Winsome	E. O. Hancock, Andrews	Ayrshire	29/9/34
34518	Para Wirra Sunrise 2nd	J. H. Dawkins, Gawler	Jersey	24/2/35
Not allotted	Barton Croft Daphne	A. J. Marrett, Saddleworth	"	28/9/34
34669	Roseworthy Princess 44th	Agricultural College, Roseworthy	"	30/11/34
41267	Ninyeri Duchess	E. L. Goode, Narrung	"	17/11/34
5370	Kiama Pretty Maid	E. & A. Nicholls, Woodville	A.I.S.	27/11/34
5425	Long Flat Mayflower	Mrs. A. H. Spackman, Long Flat	"	1/12/34
3238	Wollongbar Nannette 2nd	S. W. Burns, Woodside	Guernsey	15/12/34
38619	Woodside Mabel's Countess	A. B. Sieber, Eudunda	Jersey	13/10/34
Not allotted	Anama Pontiac Dainty Maid	W. Hawker, Clare	Friesian	5/12/34
"	Maiwand Viola 2nd	A. P. Spehr, Mount Gambier	Jersey	3/11/34
"	Rosetta 16th of Burradale	W. Nitschke & Son, Littlehampton	A.I.S.	12/12/34
35763	Girrahween Bessie	A. B. Sieber, Eudunda	Jersey	31/1/35
25190	Kyby Bessie	Government Farm, Kybybolite	Ayrshire	11/3/35
44808	Lallawa Chieftain's Mystery	J. F. Dodd, Meningie	Jersey	10/11/34
Not allotted	Anama Dainty Jewel	W. Hawker, Clare	Friesian	19/5/35
"	Murray Glen Netherland Pauline	C. J. Morris, Monteith	"	4/2/35
SENIOR FOUR-YEAR-OLDS—				
34634	Lakeland Lily	H. B. Peters, Mount Compass	Jersey	18/11/34
6656	Tabbagong Dairymaid 11th	J. M. Irwin, Mount Barker	A.I.S.	3/3/35
31144	Lanacoona Miss Kelly	C. E. Verco, Mount Compass	Jersey	24/3/35
34515	Para Wirra Magiona 2nd	J. H. Dawkins, Gawler	"	6/10/34
31145	Pella Fairy Lotus	H. R. Walsh, Mount Barker	"	16/12/34
34680	Gum Hill June	P. O. Schutz, Eudunda	"	2/3/35

OFFICIAL TEST—*continued.*

Age at Calving.			Total Milk.	Average Test.	Total Butter fat.	Days Tested.	Sire.	Remarks.
Y.	M.	D.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 270LBS.—*continued.*								
3	1	12	4,360½	6·43	280·41	273	Wooroora King's Hero	—
3	5	18	6,900	3·95	272·69	240	Ruth's Limelight of Wangara	Withdrawn
3	0	5	6,507	4·19	272·33	273	Loyalty of Bridge View	—
3	0	17	5,494½	4·84	266·14	273	Producer 5th of Dalebank	—
3	2	27	6,463	4·01	259·26	273	Northfield Janet's Success	—
3	2	17	6,603½	3·87	255·79	273	Northfield Limelight's Prince	—
3	4	14	5,599½	4·48	250·75	273	Viscount of East View	—
3	5	7	5,875½	3·92	230·54	273	Janet's Royal of Northfield	—
3	5	15	4,050	5·43	219·84	210	Lallawa Chieftain 2nd	Withdrawn
3	3	20	3,975	5·33	211·84	180	Makarini of Dalebank	Owner ceased testing
3	2	29	5,550	3·68	204·43	240	Janet's Royal of Northfield	Withdrawn
3	3	11	4,135½	4·45	184·20	273	Melba's Limelight of Wangara	—
3	3	25	3,855	4·15	160·03	210	Loyalty of Bridge View	Dried off
3	3	2	1,050	4·02	42·23	30	Para Vale Lord Mac	Sold
BUTTERFAT STANDARD, 290LBS.								
3	11	27	13,344	3·74	498·42	273	River Glen Lord Echo Griselda	—
3	6	10	9,087	4·73	430·04	273	Banyule Pylon	—
3	9	10	7,071	5·99	423·52	273	Brucevale Lord Fancy Starbright	—
3	8	3	7,512	5·06	380·23	273	Delma Butter King	—
3	10	14	6,372	5·92	377·27	273	Para Wirra Sunshine's Twylish 2nd	—
3	7	23	9,510	3·93	373·97	273	Pembroke of Greyleigh	—
3	6	12	6,779	5·49	371·90	273	Snowflake's Chief of Para Wirra	—
3	8	1	6,532½	5·59	365·09	273	Wollingurry Cavalier's Silver King	—
3	11	19	6,034½	5·69	343·31	273	Austral Park Goldfinder	—
3	9	26	5,584½	5·70	318·42	273	Austral Park Goldfinder	—
3	11	14	7,935	3·76	298·19	273	Royal Success of Arrawatta	—
3	9	0	6,163½	4·80	295·56	273	Para Wirra Cherry Pylon	—
3	9	11	5,070	5·39	273·15	210	Delma Butter King	Withdrawn
3	7	29	5,355	4·64	248·63	240	Palla Northwood Cavalier	Sold
3	9	0	5,865	4·23	247·88	180	Glenowie Netherland Prince 2nd	Owner ceased testing
3	6	9	4,822½	4·99	240·42	273	Dalebank Viola's Duke	—
3	6	2	6,631½	3·57	236·94	273	Janet's Royal of Northfield	—
3	7	15	4,110	5·71	234·79	210	Chieftain 2nd of Dalebank	Withdrawn
3	9	19	3,126	6·16	192·48	273	Dalebank Viola's Duke	—
3	6	24	3,420	5·23	178·98	180	Boroni of Rockness	Withdrawn
BUTTERFAT STANDARD, 310LBS.								
4	1	1	10.969½	4·33̇	474·68	273	Gowrie Park Dairyman	—
4	5	21	7,038	6·17	434·43	273	Banyule Pylon	—
4	4	28	7,873	5·09	401·02	273	Rockness Gold Socks	—
4	3	11	7,539	5·25	395·64	273	Mercedes Sweet Duke of Glen Iris	—
4	2	8	9,187½	4·27	392·11	273	Morella Mercedes Sweet Duke	—
4	4	18	9,954	3·93	390·87	273	Viscount of East View	—
4	5	14	9,535½	3·78	360·60	273	Liberton Gladiator 2nd	—
4	2	3	5,658	6·29	356·05	273	Wollongbar Adonis	—
4	1	4	7,253	4·83	350·38	273	Anemone's Lily Oxford	—
4	3	9	8,833½	3·91	345·18	273	Totara Pontiac Dainty Boy	—
4	3	10	7,267½	4·47	324·90	240	Duke of Belgonia	†
4	5	11	8,393	3·85	323·30	273	Burradale Envoy	—
4	3	11	5,014½	6·39	320·49	273	Rosecliffe Bright Star	—
4	3	18	6,978	4·57	318·93	273	Gowrie Park Scottish Dandy	—
4	4	0	5,211	5·29	275·60	273	Dalebank Chieftain 2nd	—
4	2	2	6,525	4·05	264·35	180	Totata Pontiac Dainty Boy	Withdrawn
4	1	0	7,050	3·71	261·78	210	Murray Glen Netherland King	Died
BUTTERFAT STANDARD, 330LBS.								
4	10	18	9.780	5·98	584·73	273	Dalebank Flavius	—
4	10	13	11,416½	4·19	477·89	273	Regent of Tabbagong	—
4	9	21	8,950½	5·21	466·35	273	Dalebank Noble Duke	—
4	11	1	7,297½	5·58	407·27	273	Banyule Pylon	—
4	10	4	6,450	6·15	396·54	273	Wollingurry Cavalier's Silver King	—
4	8	12	6,687	5·39	360·51	273	Hampden Carnation's Lad	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
			SENIOR FOUR-YEAR-OLDS—	
31080	Para Vale Lady Starbright	A. J. Marrett, Saddleworth	Jersey	1/11/34
5416	Northfield Limelight's Sunflower	Insp.-General Hospitals, Northfield	A.I.S.	10/12/34
33169	Glenavon Princess	A. P. Spehr, Mount Gambier	Jersey	15/10/34
Not allotted	Timbungalung Lady Carnation	Mrs. A. M. Carruthers, Narrung	"	11/10/34
40287	Inman Rose Marie	G. V. Rogers, Inman Valley	"	16/11/34
33593	Brookfield Verbena 18th	A. P. Spehr, Mount Gambier	"	26/10/34
5381	Burradale Ruby 3rd	W. Nitschke & Son, Littlehampton	A.I.S.	3/10/34
5426	Long Flat Mermaid	Mrs. A. H. Spackman, Long Flat	A.I.S.	26/3/35
34522	Lallawa Carnation 3rd	J. F. Dodd, Meningie	Jersey	27/10/34
2349	Northfield Limelight's Flirt 2nd	Insp.-General Hospitals, Northfield	A.I.S.	26/12/34
2352	Northfield Royal's Flirt	Insp.-General Hospitals, Northfield	"	6/12/34
44804	Lallawa Carnation 4th	J. F. Dodd, Meningie	Jersey	12/4/35
31028	Stonyfell Hester 3rd	J. W. Crompton, Victor Harbour	"	5/4/35
33619	Woodside Mabel's Countess	A. B. Sieber, Eudunda	"	4/9/35
			MATURE COWS—	
Not allotted	Murray Glen Princess Maggie	C. J. Morris, Monteith	Friesian	10/1/35
2194	Glenowie Griselda Posch	H. Mountstephen, Monteith	"	10/10/34
Not allotted	Murray Glen Inka Olda	C. J. Morris, Monteith	"	16/3/35
1919	Murray Glen Sylvia Patch	C. J. Morris, Monteith	"	10/11/34
34497	Tuela Didiscus	C. E. Verco, Mount Compass	Jersey	8/3/35
18571	Pride 3rd of Elderslie	Mrs. A. H. Spackman, Long Flat	A.I.S.	30/12/34
5364	Kiama Bess 5th	E. & A. Nicholls, Woodville	"	17/10/34
22231	Baby Patty	C. E. Verco, Mount Compass	Jersey	11/3/35
34494	Tuela Delphinium	F. Coleman, Saddleworth	"	13/10/34
28066	Tuela Drosera	F. Coleman, Saddleworth	"	15/2/35
31040	Craigdarroch Magic	Mrs. A. Bowman, Meningie	"	2/10/34
2503	Murray Glen Segis Inka	C. J. Morris, Monteith	Friesian	11/10/34
Not allotted	Cotswold Sheila	H. B. Peters, Mount Compass	"	24/10/34
8076	Tuela Sparaxis	F. Coleman, Saddleworth	Jersey	20/11/34
24631	Cotswold Gem	H. B. Peters, Mount Compass	"	8/11/34
32333	Kiama Mayflower 6th	E. & A. Nicholls, Woodville	A.I.S.	28/12/34
24853	Hampden Maybee	J. A. J. Pfitzner, Hampden	Jersey	23/3/35
1214	Brush Grove Poppy 4th	P. J. A. Braendler, Ambleside	A.I.S.	3/12/34
5365	Kiama Mayflower 7th	E. & A. Nicholls, Woodville	"	4/11/34
22713	El Rimal Pearl	E. O. Hancock, Andrews	Ayrshire	27/2/35
31149	Morella Princella 3rd	H. R. Walsh, Mount Barker	Jersey	5/12/34
28142	Brinkworth Jewel	C. C. T. Ottens, Brinkworth	"	23/10/34
28084	Para Wirra Millie's Beauty	O. H. Woodward, Gilles Plains	"	9/2/35
3651	Murray Glen Netherland Butterfly	C. J. Morris, Monteith	Friesian	1/2/35
29484	Wompini Lady Jane Grey	H. B. Peters, Mount Compass	Jersey	27/2/35
28083	Stonyfell Rosa	J. W. Crompton, Victor Harbour	"	14/3/35
24824	Sweet Haven Mercedes Bloom	J. M. Bray, Langhorne's Creek	"	15/1/35
20777	Lady Floretta of Gum Hill	P. O. Schutz, Eudunda	"	25/2/35
18329	Kiama Pembroke's Olive	E. & A. Nicholls, Woodville	A.I.S.	17/3/35
28163	Morella Belle 3rd	E. L. Goode, Narrung	Jersey	19/10/34
31110	Hampden Rachel	Agricultural College, Roseworthy	"	11/10/34
31033	Para Wirra Millie's Goldstream II.	J. H. Dawkins, Gawler	"	6/4/35
1945	Mark's Villa Rose 3rd	P. J. A Braendler, Ambleside	A.I.S.	25/11/34
31126	Roseworthy Princess 37th	Agricultural College, Roseworthy	Jersey	14/12/34
18326	Kiama Mayflower 4th	E. & A. Nicholls, Woodville	A.I.S.	14/11/34
25056	Roseworthy Sciential	Agricultural College, Roseworthy	Jersey	22/3/35
3220	Wingeewah Doris 15th	J. M. Irwin, Mount Barker	A.I.S.	27/12/34
2334	Liberton Honeycomb	E. & A. Nicholls, Woodville	"	25/10/34
3222	Wingeewah Vera's Belle 4th	J. M. Irwin, Mount Barker	"	4/11/34
18369	Northfield Royal's Sunflower	Inp.-General Hospitals, Northfield	"	21/12/34
31156	Scrub View Dainty's Lass	A. B. A. Weckert, Brinkworth	Jersey	3/2/35
29481	Wompini First Clementine	O. H. Woodward, Gilles Plains	"	9/11/34
24861	Fernden Lady Beth	O. H. Woodward, Gilles Plains	"	2/12/34
21832	Kyby Bess	Government Farm, Kybybolite	Ayrshire	30/1/35
20287	Grange Hill Gertie	Insp.-General Hospitals, Northfield	"	9/10/34
31147	Morella Belle 5th	H. R. Walsh, Mount Barker	Jersey	21/11/34
2481	Glenlea Dixie 5th	E. T. Vinall, Brighton	Guernsey	25/12/34
2455	Glenowie Echo Posch	H. Mountstephen, Monteith	Friesian	12/12/34
25028	St. Helier's Mystery	J. F. Dodd, Meningie	Jersey	29/3/35
24081	Kyby Blossom	Government Farm, Kybybolite	Ayrshire	31/10/34
24694	Pembroke Sylvia	Mrs. C. W. Ansell, Bolivar	Jersey	23/11/34
32971	Staghorn Clarabelle	Mrs. D. G. Steven, Kooringa	"	18/2/35
23641	Morella Damsel 2nd	E. L. Goode, Narrung	"	20/10/34
21839	Kyby Rose 4th	Government Farm, Kybybolite	Ayrshire	25/10/34
18344	Tot 3rd of Wangara	P. J. A. Braendler, Ambleside	A.I.S.	5/12/34
9017	Kyby Rose	Government Farm, Kybybolite	Ayrshire	28/10/34
Not allotted	Picture of East View	W. Nitschke & Sons, Littlehampton	A.I.S.	16/10/34



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OFFICIAL TEST—*continued.*

Age at Calving.	Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Y. M. D	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 290LBS.—*continued.*						
4 11 27	6,495	5·41	351·35	240	Brucevale Lord Fancy Starbright	Withdrawn
4 7 12	8,142½	4·21	342·47	273	Melba's Limelight of Wangara	—
4 10 20	6,282	5·06	318·15	273	Murta Lloyd	—
4 6 25	5,838½	5·22	304·63	273	Timbungalung Butter King	—
4 6 4	4,530	6·12	277·40	210	Makarini 2nd of Dalebank	Owner ceased testing
4 11 28	5,136	5·30	272·20	273	Sweetbread's Duke of Glen Iris	—
4 8 27	6,462	4·00	258·45	273	Lovely's Earl of Glenthorne	—
4 6 11	6,060	3·95	239·35	240	Ruth's Limelight of Wangara	Withdrawn
4 8 15	4,140	5·49	227·30	210	Dalebank Chieftain 2nd	Withdrawn
4 10 28	6,521½	3·26	212·89	273	Melba's Limelight of Wangara	—
4 10 18	4,778½	3·90	186·39	273	Janet's Royal of Northfield	—
4 6 22	3,090	5·64	174·24	120	Dalebank Chieftain 2nd	Withdrawn
4 8 3	1,980	6·14	121·54	90	Mack of Glenford	Withdrawn
4 11 25	570	4·14	23·61	30	Anemone's Lily Oxford	Withdrawn
BUTTERFAT STANDARD, 350LBS.						
7 2 13	13,453½	4·51	606·75	273	Glenburn Segis Griselda	—
9 10 27	18,808½	3·18	597·29	273	River Glen Sir Pietje Griselda	—
6 0 3	12,264	4·71	578·19	273	River Glen Lord Echo Griselda	—
10 5 21	15,322½	3·66	561·23	273	Burnbank Sylvie Patch	—
5 6 13	10,507½	5·23	549·37	273	Baron of Dalebank	—
5 7 0	15,414	3·53	544·45	273	Marvellous of Hill View	—
5 11 9	11,960	4·54	542·08	273	Viscount of East View	—
9 4 1	10,879½	4·95	538·40	273	Mike of Penrith	—
5 1 9	8,793	5·93	521·61	273	Baron of Dalebank	—
6 10 0	7,866	6·53	513·69	273	Maid's Success of Linden	—
5 6 1	9,510	5·30	504·25	273	Craigdarroch Duke	—
8 4 19	13,185	3·78	497·81	273	Glenburn Segis Griselda	—
5 2 9	8,368½	5·91	494·96	273	Duke of Dalebank	—
6 3 4	9,487½	5·18	491·20	273	Baron of Dalebank	—
5 6 12	9,066	5·42	491·06	273	Dalebank Duke	—
6 8 19	11,284½	4·25	479·22	273	Viscount of East View	—
8 9 13	8,034½	5·83	468·78	273	Carnation's Lad of Dalebank	—
6 2 28	12,850½	3·54	454·76	273	Ardee of The Hill	—
5 9 20	12,166½	3·66	445·40	273	Viscount of East View	—
5 5 26	10,339½	4 29	444·09	273	Gowrie Park Dairyman	—
5 3 19	6,810½	6·46	439·77	273	Anemone's Chief of Morella	—
5 3 20	7,638½	5·67	433·26	273	General Chris of Penrhyn	—
6 6 8	7,722	5·54	428·06	273	Molly 5th's Audrey Twylish of Bangule	—
6 4 1	12,697½	3·26	414·12	273	Long Beach Netherland King 2nd	—
7 5 9	6,831	6·00	409·58	273	Werribee Masterman	—
6 5 16	6,358½	6·31	401·10	273	Boroni of Rockness	—
6 7 19	7,338	5·43	398·78	273	Mercedes Sweet Duke of Glen Iris	—
11 4 29	8,449½	4·55	384·66	273	Werribee Starbright's Fancy	—
8 1 29	9,570	3·99	381·64	273	Pembroke of Greyleigh	—
6 5 7	7,963½	4·74	377·82	273	Anemone's Chief of Morella	—
5 6 14	6,860	5·48	376·03	273	Hampden Olive's King	—
6 1 4	7,785	4·77	371·04	210	Para Wirra Chieftain	Sold
5 11 19	9,439½	3·92	370·46	273	Prince of Elm Grove	—
6 0 14	6,856½	5·36	367·20	273	King Solomon of Dalebank	—
8 1 8	10,579½	3·45	365·08	273	Pembroke of Greyleigh	—
7 3 4	5,797½	6·17	357·49	273	King Solomon of Dalebank	—
5 4 22	9,102	3·91	356·34	273	Sir William of Willow Glen	—
5 11 0	9,897	3·60	356·22	273	Limit of East View	—
5 2 14	9,298½	3·80	353·49	273	Daphne's Defiance of Hill View	—
6 8 5	8,022	4·33	347·54	273	Royal's Success of Arrawatta	—
5 9 11	6,981	4·98	347·32	273	Holly's King of Hampden	—
6 11 6	6,075	5·71	346·59	273	Werribee Masterman	—
7 9 5	7,459½	4·63	345·27	273	Werribee Combination	—
6 2 26	8,608½	3·98	342·72	273	Loyalty of Bridge View	—
6 1 6	8,653½	3·90	337·71	273	Mack of Grange Hill	—
5 6 29	6,856½	4·79	328·18	273	Anemone's Chief of Morella	—
5 8 24	5,323½	5·97	317·60	273	Glenlea Hilda's Valour 2nd	—
9 0 8	9,564	3·28	313·50	273	River Glen Lord Echo Griselda	—
8 4 15	5,205	5·95	309·79	240	Nada's Chief of Linden	Dried off
5 0 14	6,626	4·65	307·83	273	Loyalty of Bridge View	—
8 0 7	5,040½	5·89	296·82	273	Triumph 2nd of Dalebank	—
5 5 21	4,767	5·75	274·31	273	Staghorn Northlark's Masterpiece	—
7 7 14	6,504½	4·21	274·02	273	Anemone's Chief of Morella	—
6 5 19	6,870	3·99	273·95	240	Loyalty of Bridge View	—
7 2 20	6,795	3·93	267·03	240	Limelight of Darbalara	Dried off
14 11 9	7,069½	3·75	264·99	273	Anthony of Gleneira	—
6 2 29	6,217½	4·25	264·19	273	Belmont of Darbalara	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner and Address.	Breed.	Calved.
MATURE COWS—BUTTERFAT				
Not allotted	Lakeland Countess Hermia	H. R. Walsh, Mount Barker	Jersey	4/10/34
2461	Glenowie Pauline Griselda	H. Mountstephen, Monteith	Friesian	—/3/35
25191	Kyby Blonde	Government Farm, Kybybolite	Ayrshire	18/3/35
24692	Pembroke Duchess	Mrs. C. W. Ansell, Bolivar	Jersey	6/11/34
34517	Para Wirra Sunbeam 2nd	J. H. Dawkins, Gawler	"	16/6/35
Not allotted	Northfield Blossom 2nd	Insp.-General Hospitals, Northfield	A.I.S.	2/1/35
"	Kyby Wanda	Government Farm, Kybybolite	Ayrshire	6/11/34
28059	Myrtle Bank Maglona 2nd	H. & A. Bohme, Balhannah	Jersey	3/3/35
23634	Cheriton Foam	H. R. Walsh, Mount Barker	"	20/2/35
2603	Minnamurra Bonny Girl	S. W. Burns, Woodside	Guernsey	1/12/34
28090	St. Helier's Barbara	J. F. Dodd, Meningie	Jersey	22/5/35
31030	Para Wirra Eileen 3rd	J. H. Dawkins, Gawler	"	22/8/35
23621	Roseworthy Princess 25th	Agricultural College, Roseworthy	"	20/9/35

N.B.—Tenth tests were required for the cows marked thus, †, but could not be obtained, therefore the

BUTTERFAT TESTS (OFFICIAL) FOR HALF-YEAR ENDED 31ST DECEMBER, 1935, OF PURE AND OF FOUNDATION

Particulars of Registration.	Name of Cow.	Owner and Address.	Breed.	Calved.
JUNIOR TWO-YEAR-OLDS—				
C.R. only	Kyby Ringlet	Government Farm, Kybybolite	Ayrshire	14/10/34
C.R. only	Kyby Wandanette	Government Farm, Kybybolite	"	30/12/34
C.R. only	Bellalie Fussy's Beauty	Calf Club, Sutton Town	A.I.S.	10/11/34
C.R. only	Hazelbrook Lois	J. N. Reid, Oakbank	Ayrshire	20/8/35
C.R. only	Kyby Gem	Government Farm, Kybybolite	"	18/9/35
SENIOR TWO-YEAR-OLDS—				
C.R. only	Glenowie Salma Patch	H. Mountstephen, Monteith	Friesian	—/3/35
JUNIOR THREE-YEAR-OLDS—				
C.R. only	Glenowie Lady Helen	H. Mountstephen, Monteith	Friesian	—/3/35
JUNIOR FOUR-YEAR-OLDS—				
Appendix B	Mount Annan Cowrie	J. M. Irwin, Mount Barker	A.I.S.	19/3/35
Appendix	Glenbank Betsy	J. M. Irwin, Mount Barker	"	18/6/35
SENIOR FOUR-YEAR-OLDS—				
Appendix I	Hurwyn Echo Molly	H. Mountstephen, Monteith	Friesian	23/10/34

SALT PATCHES OF LAND IN DISTRICTS OF HIGH RAINFALL.

A member of the Mount Compass Branch of the Agricultural Bureau has referred the following question to the Department of Agriculture:—"I have always been under the impression that salt patches in wheat-growing country were caused by evaporation of soil moisture in years of low rainfall and disappeared in years when rainfall was higher than usual. From my observation, this has been my experience. If this is so, why should there be salt patches in the Mount Compass district, which has a rainfall of about 30in. or more?"

Replying to the question, Professor A. J. Perkins (Director of Agriculture) says:—

"On general principles it would be incorrect to state that causal factors leading to the formation of salt patches in wheat country of about 12in. of rain were confined to evaporation of soil moisture in years of low rainfall. The question is far more complicated than that, and depends much upon local conditions and factors, of which moisture conditions are one, but not the only one. It has frequently been noted that in some districts salt patches often developed after years of unusually heavy rainfall, and the probable explanation was that the country in question was mildly impregnated with saline matter to several feet in depth; that in years of exceptional rainfall the

OFFICIAL TEST—*continued.*

Age at Calving.	Total Milk.	Aver-age Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.	%	Lbs.			
STANDARD, 350LBS.—*continued.*						
5 — 19	4,476	5·49	245·83	273	Timbungalung Bluebell's Masterpiece	—
9 — —	6,090	3·99	242·91	210	River Glen Sir Pietje Griselda	Owner ceased testing
5 — 24	5,190	4·60	238·80	240	Gowrie Park Scottish Dandy	Dried off
8 3 26	4,330½	5·33	230·70	273	Triumph 2nd of Dalebank	—
5 1 27	5,885	4·26	229·30	120	Banyule Pylon....................	Sold
6 2 3	5,113	4·38	221·53	273	Muirhead of Ben Lomond	—
5 4 29	4,515	4·85	219·20	240	Gowrie Park Scottish Dandy	Dried off
6 6 0	4,227	5·07	214·32	273	Annette's Chief of Linden	—
8 2 19	3,555	5·61	199·53	210	Maud's Chief 2nd of Linden	Sold
5 9 26	3,585	5·15	184·76	210	Caramana Favour	Withdrawn
8 7 26	3,555½	4·92	175·01	120	Nada's Chief of Linden	Withdrawn
6 5 7	2,830	4·97	140·75	60	Para Wirra Chieftain	Sold
8 10 24	1,065	4·41	46·98	30	King Solomon of Dalebank	Sold

cows concerned have been credited with only 240 days' production.

BREDS WHICH ON 31ST DECEMBER, 1935, WERE REGISTERED IN THE CALF ROLL ONLY, AND APPENDIX COWS.

Age at Calving.	Total Milk.	Aver-age Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Y. M. D.	Lbs.		Lbs			
BUTTERFAT STANDARD, 230LBS.						
2 — 28	5,388	3·94	212·16	273	Gowrie Park Leyland	—
2 — 7	4,278½	4·62	197·50	273	Gowrie Park Scottish Dandy	—
2 1 23	3,015	3·52	106·11	240	Illawarra Miller 2nd	Dried off
1 11 4	810	4·51	36·54	30	Hazelbrook Advance	Sold
1 11 17	435	4·34	18·90	60	Gowrie Park Leyland	Dried off
BUTTERFAT STANDARD, 250LBS.						
2 10 0	7,170	4·05	290·32	210	Glenowie Netherland Prince 2nd	Owner ceased testing
BUTTERFAT STANDARD, 270LBS.						
3 5 —	7,980	3·91	311·94	180	Glenowie Colantha Netherland	Withdrawn
BUTTERFAT STANDARD, 310LBS.						
4 5 28	9,493½	3·82	362·94	273	Pet's Belmont of Kiama	—
4 3 22	5,250	3·91	205·57	180	Glenbank Alick	Withdrawn
BUTTERFAT STANDARD, 330LBS.						
4 9 11	12,150	3·05	370·49	273	Alneholm Echo Matador	—

surface moisture penetrated to greater depths than usual, and came in contact with hitherto untapped saline layers of soil; that in succeeding years some of this saline matter rose to the surface, under the influence of surface evaporation, giving rise to salt patches, which might subsequently be dispersed by sufficiently heavy winter rains. Sometimes it was a question of the relative slope of underground more or less impervious soil layers, which tend to lead water impregnated with salt to accessible lower levels.

Although not acquainted with the Mount Compass salt patches, the Director points out that the saline matter need not necessarily have originated at Mount Compass itself; it might easily have been conveyed to the district from a distance by means of running water, either underground or surface.

Again, the salt might be derived from the decomposition of local rock, the salt water seeping along lines of cleavage, and frequently finding an outlet along sloping hills.

Moreover, because Mount Compass has a heavy rainfall to-day, it does not follow that this has been so throughout earlier geological periods. The foundations of the salt trouble may date back to a very distant period, and if it be present in the district, heavy rains will tend gradually to distribute it; but unless there was a completely adequate natural outlet to the sea, some of the salt would re-appear from time to time in the shape of salt patches of permanent or temporary character.

BLACK PIECES IN DRIED APRICOTS.

[A. G. STRICKLAND, M.Sc. (Chief Horticultural Instructor).]

Reporting that during the past drying season that the percentage of black pieces in dried apricots showed a considerable increase over previous years, and that growers were definite in their statement that when the fruit was cleared from the trays there were no black pieces placed in the sweat boxes, the Secretary of the Ramco Branch of the Agricultural Bureau has asked for an explanation of this trouble from the Department of Agriculture.

Mr. Strickland says:—The chemical mechanism of darkening of various fruits at cut surfaces differs somewhat according to the type of fruit concerned, but invariably the action is one of oxidation of one or more substances in the plant tissue. The course of this oxidation, by which coloured substances are formed, is assisted by various enzymes which are naturally present in the fruit; if such "enzymes" are killed or inhibited, the oxidation process moves slowly enough to enable drying of the cut fruits before appreciable discolouration has taken place. Sulphur dioxide is customarily used to inhibit the enzyme action, and enable production of non-discoloured dried fruit.

Exactly why certain individual pieces of apricots should blacken is not definitely known, but such blackening implies that the enzymes have not been completely inhibited (perhaps through insufficient sulphur content of the particular pieces) and/or that, owing to the presence of some moisture, there is opportunity given for some oxidation and consequent discolouration.

Tests carried out by this Department some years ago showed that the higher the sulphur content of the fruit the better the maintenance of bright colour; this is to be expected. Furthermore, it was shown that generally the riper the fruit the higher and more rapid the sulphur impregnation. One would not, therefore, expect riper fruit to exhibit necessarily more darkening than less ripe fruit.

Fruit which is kept moist after drying is more liable to suffer oxidation and consequent darkening.

It is possible that dark pieces occur owing to insufficient SO_2 content, and it is intended to carry out analyses with the object of gaining information on this particular phase of the problem. The desire to obtain a moist pack also has bearing; if certain individual fruits by some mischance do not get an adequate dosage of sulphur dioxide, and the fruit is then held under moist conditions, these under-sulphured fruits would have favourable conditions for oxidation and darkening.

I quote hereunder a report by Mr. N. S. Fotheringham, Manager of the Berri Experimental Orchard, which report elaborates some of the above points:—

"Considerable work was done here with the sulphuring of apricots some years back. This work was in connection with the sulphur content of apricots, and samples of all tests made were forwarded to Adelaide and kept there for a considerable time for periodical analyses.

"We know that the longer we keep apricots the darker they become, and that light-sulphured fruit will not retain its colour as long as well-sulphured fruit. We also know that unsulphured apricots dry out dark, and soon become almost black.

Until the last few years, the tendency has been to have apricots practically chip dry, but of latter years it has been the desire of the packing houses to pack a moist pack for export purposes, and they have been treating them to make a moist pack.

"Some years ago I remember a parcel of dried apricots coming from South Africa. These were moist packed, and the whole lot went coal black in a very short time. The SO_2 content of them I do not know. It appears to me to be possibly a combination of moisture and light sulphuring that tends to accelerate blackening.

"Moisture seems necessary for this action to take place, and I think that apricots under sulphured, and their colour not fixed, when they become moist undergo this action, and become dark. The action may possibly be hastened by being sweated in sweat boxes when too moist."

VACCINATION EXPERIMENTS WITH ENTERO-TOXAEMIA VACCINE AT KYBYBOLITE, 1935.

[L. J. Cook, Manager, Kybybolite Experimental Farm.]

Half of the sheep on the Farm were vaccinated this year with Entero-Toxaemia Vaccine. Each flock was divided evenly according to age and development, one half being vaccinated, and the other half maintained as controls. One hundred and ninety-one in-lamb ewes, and 219 hoggets were treated on 4th/5th June, and 1st/2nd July. Two hundred and fifty-two ewes with lambs at foot, and 202 lambs were treated on 13th/14th August, and 9th/10th September.

Amongst the six flocks vaccinated in June and July, 8 deaths have occurred up to 1st January, 1936, and of these 4 were classed as having symptoms suspicious of Entero-Toxaemia. The other four definitely did not show any signs of this disease. The four former cases all occurred amongst the controls of the flocks with details as follows:—

1. 1934 Comeback ewe hogget, grazing on topdressed natural pastures, died on 28th August. Sample of ingesta from small intestine forwarded to Stock Department 28/8/35.
2. 1933 Comeback ewe, grazing on topdressed natural pasture died on 14th September. Sample of ingesta forwarded 16/8/35.
3. 1928 Comeback ewe, grazing on topdressed natural pasture died 10th October. Died in woolshed over night. No sample collected.
4. 1930 Comeback ewe, grazing on Subterranean Clover, and annual grass pasture died 18th October. Also died in woolshed over night. No sample taken.

Summary; amongst the 191 ewes inoculated before lambing in June and July, no deaths occurred that possessed any symptoms of Entero-Toxaemia, whilst amongst 191 similar ewes used as controls, three deaths occurred, that appeared to be caused by Entero-Toxaemia. Also, amongst 219 hoggets innoculated at the same time, only one death occurred, and that possessed no symptoms of the disease, whilst amongst 219 similar hoggets used as controls, one death occurred with suspicious symptoms of Entero-Toxaemia.

Amongst the three flocks of ewes and lambs treated in August and September, 19 ewes and 14 lambs died between 16th August, 1935, and 1st January, 1936. The two flocks of Comeback ewes in this group suffered from a fair amount of foot trouble during the period, and of the deaths, only 8 ewes and 6 lambs showed symptoms of Entero-Toxaemia. Of these, only two ewes were vaccinated, the other six and the six lambs being all amongst the controls in the flocks. The former cases were both dry ewes, and died on the 18th August, five days after the first injection of vaccine was given. One was an English Leicester stud ewe (1933 drop), and the other a Comeback ewe (1932 drop).

The six deaths of ewes amongst the controls occurred as follows:—

1. English Leicester ewe, 1932 drop, with lamb at foot, died on 28th August. Sample of ingesta forwarded to Chief Inspector of Stock 28/8/35.
2. Comeback ewe died at sheep yards on 9th September. Sample ingesta forwarded 9/9/35.
3. Full mouthed Comeback ewe died on 20th September. Sample of ingesta forwarded 20/9/35.
4. English Leicester dry ewe, 1933 drop, died on 27th November with suspicious symptoms of Entero-Toxaemia.
5. Old English Leicester dry ewe, 1926 drop, also died on 27th November with doubtful symptoms of Entero-Toxaemia. This ewe was very fat, and death may have been influenced by hot weather.
6. Full-mouthed Comeback ewe died on 2nd December with doubtful symptoms of the disease.

Regarding the six deaths of lambs amongst the controls, particulars are as follows:—

1. English Leicester stud lamb in good condition died in the woolshed on 7th September with suspicious symptoms, but no sample could be obtained.
2. Comeback x English Leicester lamb died in the field on 9th September, but no sample could be obtained.
3. Two Comeback x Dorset Horn lambs in very good condition died on 14th October with apparent typical symptoms of Entero-Toxaemia, but carcasses were found too late for sampling.
5. Comeback x Suffolk good conditioned lamb died in field on 7th November, also with very suspicious symptoms.
6. Comeback x Dorset Horn good conditioned lamb died in the field on 9th November. Sample forwarded 9/11/35.

Summary; amongst the 252 ewes vaccinated in August, two deaths occurred before the second vaccination was given, but no deaths suspicious of Entero-Toxaemia occurred afterwards. Whilst amongst the 252 similar ewes used as controls, six deaths occurred that appeared to be caused by Entero-Toxaemia.

Also, amongst the 202 lambs vaccinated, no deaths occurred that could be attributed to this disease, whilst amongst the 202 similar lambs used as controls, six deaths occurred with symptoms very typical of the disease.

Finally, amongst the whole 864 sheep vaccinated, 11 deaths have occurred, of which only two could be attributed to Entero-Toxaemia, and amongst the 864 control sheep not vaccinated, 30 deaths occurred, of which 16 could be attributed to Entero-Toxaemia.

It is perhaps unfortunate that the analyses of the six samples of ingesta forwarded to the Stock Department did not throw any definite light on the identifying of the bacteria, but it is considered that the vaccinations have saved a certain loss of stock. The assistance given by the Veterinary Officers was much appreciated.

VACCINATION OF SHEEP—ENTERO-TOXAEMIA—KYBYBOLITE EXPERIMENTAL FARM, 1935-36.

Date of First Injection.	No. of Sheep.	Date of Second Injection.	No. of Sheep.	Sheep and Particulars.	Deaths.	Date of Death.	Cause of Death.	Remarks.
June 4 ...	184	July 1	184	Comeback hoggets 1934 spring drop—				
				124 mixed sexes general farm pasture	1*	Oct. 23	Not known ...	No symptoms E.T.
				20 ewes natural pasture (top dressed)	1	Aug. 28	Suspicious E.T.	In control flock
				20 ewes, Sub. Clover and Wimmera Rye	0	—	—	—
				20 ewes Sub. Clover and *Phalaris tuberosa*	0	—	—	—
June 4-5 ..	25	July 1-2	25	Comeback ewes on natural pasture (top dressed)—	—	—	—	—
				1929 drop, 5; 1931 drop, 4; 1933 drop, 10; 1930 drop, 2; 1932 drop, 4	0	—	—	—
June 4-5 ..	98	July 1	98	Three flocks Comeback ewes on Sub. Clover and annual grasses—	1	Aug. 28	Lambing	1932 ewe
				1929 drop. 23; 1932 drop, 13	1*	Oct. 8	Digestive	1929 ewe (destroyed)
				1930 drop, 20; 1933 drop, 25	1	Oct. 18	Suspicious E.T.	1930 ewe from controls
				1931 drop, 17; total 98				
June 4-5 ..	62	July 1-2	62	Comeback old ewes, 1928 drop—	1	Sept. 14	Suspicious E.T.	Control natural pasture
				20 on natural pasture top dressed	1	Oct. 10	Suspicious E.T.	Control natural pasture
				10 on Sub. Clover and Wimmera Rye grass				
				10 on Sub. Clover and *Phalaris tuberosa*	1*	Oct. 29	Internal parasites	Sub. Clov. and Wim. Rye
				22 on mixed pasture				
June 4-5 ..	6	July 2	6	Comeback ewes on virgin natural pasture—				
				4 (1928 drop)	—	—	—	—
				2 (1933 drop)	0	—	—	—
June 4-5 ..	35	July 1-2	35	English Leicesters on general pasture and some barley grain during July and August—				
				28 hoggets mixed sexes	—	—	—	—
				7 rams, 1933 drop	0	—	—	—

* Vaccinated.

All sheep vaccinated had a similar number unvaccinated running on same pasture under same conditions, and these are referred to as controls in remarks column.
Vaccinated sheep branded for identification 7 red paint on rump.
Losses in previous years mainly confined to weaners (hoggets).

VACCINATION OF SHEEP—ENTERO-TOXAEMIA—KYBYBOLITE EXPERIMENTAL FARM.

Date of First Injection.	No. of Sheep.	Date of Second Injection.	No. of Sheep.	Sheep and Particulars.	Deaths.	Date of Death.	Cause of Death.	Remarks.
Aug. 13 ..	51	Sept. 9-10	49	English Leicester ewes—General farm pasture	1*	Aug. 18	Suspicious E.T.	1933 dry ewe
				1933 drop, 10 (5 dry); 1930 drop, 11 (3 dry)	1	Aug. 28	Suspicious E.T.	1932 control wet ewe
				1932 drop, 8 (2 dry); aged, 10 (3 dry)	2	Nov. 27	Suspicious E.T.	1933 and 1926 dry ewes, control
				1931 drop, 12 (2 dry)				
Aug. 13 ..	36	Sept. 10	36	English Leicester lambs—General farm pasture	1	Sept. 7	Suspicious E.T.	Control
				Mixed sexes dropped July, 1935	2†	Oct. 28	Unthrifty	Destroyed
					1	Nov. 28	Lung affect.	After dipping
					1*	Dec. 16	Not known	—
Aug. 13 ..	99	Sept. 9	96	Comeback ewes—General farm pasture	1	Aug. 16	Lambing	—
				48 four-tooths (8 dry)	1	Aug. 18	Suspicious E.T.	1932 dry ewe
				35 six-tooths (4 dry)	1	Aug. 27	Lambing	—
				16 eight-tooths (2 dry)	1	Sept. 9	Suspicious E.T.	Control
					1	Sept. 12	Not known	—
					1*	Sept. 29	Digestive	1933 ewe ill some days
					1*	Oct 28	Bad foot rot	—
Aug. 13 ..	71	Sept. 9	71	Comeback x English Leicester lambs—General farm pasture	1	Sept. 9	Suspicious E.T.	Control
				Mixed sexes dropped July, 1935	1	Oct. 23	Deformed	Destroyed
					1	Dec. 10	Fly Blow	—
Aug. 14 ..	107	Sept. 9-10	106	Comeback ewes—Subt. Clover and annual grasses	1	Aug. 22	Digestive	—
				Full mouths, including seven dry	1*	Sept. 9	Digestive	—
					1	Sept. 20	Suspicious E.T.	Control
					1	Oct. 23	Not known	—
					1*	Oct. 27	Foot rot	—
					1	Dec. 2	Suspicious E.T.	Control
					1	Dec. 4	Not known	—
					1*	Dec. 19	Foot rot	—
Aug. 14 ..	95	Sept. 10	95	Crossbred lambs mixed sexes—Sub. Clover and annual grass	2	Oct. 14	Suspicious E.T.	Controls Dorset H
				18 Comeback x Dorset Horn, 18 Comeback x Ryeland	1	Oct. 27	Bloat	Ryeland Crossbred
				22 Comeback x Southdown, 22 Comeback x Suffolk	1	Nov. 7	Suspicious E.T.	Control Suffolk Cross
				15 Comeback x English Leicester	1	Nov. 8	Suspicious E.T.	Control Dorset Cross
					1	Dec. 2	Unthrifty	Control Ryeland Cross

* Vaccinated. † One vaccinated. E.T.—Entero=Toxaemia.

All sheep vaccinated had a similar number unvaccinated running on same pasture under same conditions, and these are referred to as controls in remarks column.
Vaccinated sheep branded for identification 7 red paint on rump.
Losses in previous years mainly confined to weaners (hoggets).

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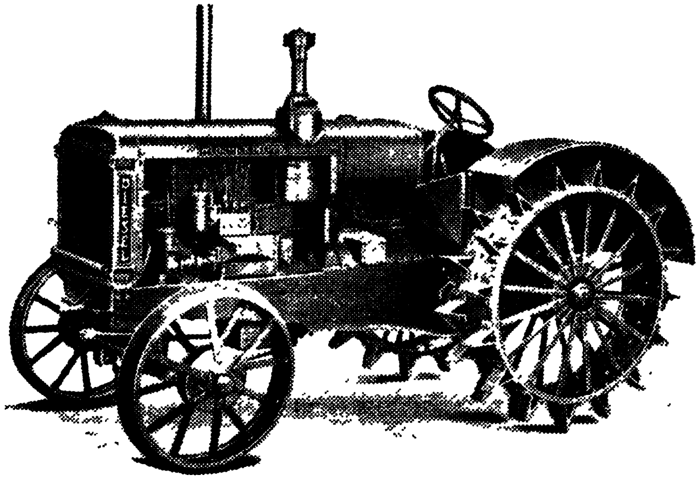

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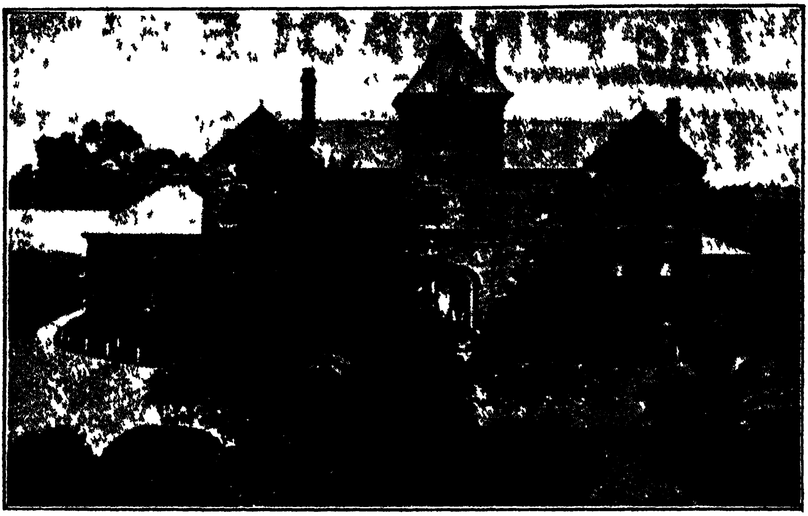

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THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow July to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow July to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	9·10	7·03	4,427½	486·54	2,864·02	225·57	24·79	148·15	5·10
7/P ..	29·53	26·30	22,685½	768·26	3,352·33	1,015·12	34·37	156·24	4·48
7/Tt .	16·47	14·53	13,855	841·31	3,576·45	567·43	34·45	152·19	4·09
7/Bbb	78·37	61·77	49,154	627·20	2,769·67	2,215·15	28·27	123·69	4·51
7/Ddd	12	11·37	8,507	708·91	3,828·87	406·92	33·91	182·78	4·78
7/Eee	12	11	7,785	648·75	3,194·35	397·15	33·10	158·56	5·10
7/Ggg	17·33	16·03	10,892½	629·49	2,442·81	512·72	29·59	115·40	4·69
7/Hhh	14	14	14,295	1,021·05	3,032·74	464·63	33·19	98·91	3·25
7/Iii .	15·87	14·87	16,053	1,011·50	3,086·34	551·36	34·74	109·42	3·43
7/Kkk	25	24	21,435	857·40	3,473·93	1,010·29	40·41	165·02	4·71
7/Mmm	15·33	14·23	10,322	673·31	2,809·64	515·09	33·60	145·97	4·99
7/Nnn	18	17	14,843½	800·58	3,630·44	633·77	34·19	157·58	4·29
7/Ooo	23·37	18·73	13,801½	590·56	2,500·75	518·94	22·21	102·14	3·76
7/Ppp	18	18	11,321	629·00	3,008·34	554·82	30·83	143·89	4·91
7/Qqq	22	21·70	15,438	701·72	3,391·98	732·07	33·28	156·13	4·74
7/Rrr	22	18·10	13,954	634·27	2,798·99	599·19	27·24	123·64	4·29
7/Sss	8	7·70	6,845	855·62	3,719·34	238·13	29·77	146·00	3·48
7/Ttt	8·47	7·23	6,017	710·39	3,250·19	253·91	29·98	134·65	4·22
7/Uuu	21·80	21·80	14,529	666·46	2,354·75	646·01	29·63	101·08	4·45
7/Vvv	22	21·43	13,933	633·32	2,591·72	618·20	28·10	116·22	4·44
7/Www	18·53	15·07	12,521	675·71	1,339·29	514·43	27·76	55·62	4·11
7/Xxx	28·13	24·47	20,832	740·55	1,498·71	793·06	28·19	57·72	3·81
Means	20·70	18·47	14,702·11	710·40	3,109·62	635·63	30·71	137·69	4·32

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Averag e No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow October to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow October to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	36	36	27,240	756·66	1,609·16	1,464·06	40·67	86·36	5·37
5/D ..	31	30	17,580	567·10	1,261·37	1,010·30	32·59	69·91	5·75
5/E ..	38·03	38·27	21,718	571·07	1,234·36	1,171·56	30·81	65·49	5·40
5/R ..	70	60·67	31,763½	453·76	1,070·67	1,469·41	20·99	48·92	4·63
5/Z ..	39·83	36·53	28,273	709·84	1,478·54	1,531·21	38·44	80·72	5·42
5/Ee .	16·10	16·08	10,086	626·45	1,383·13	498·06	30·94	68·24	4·94
5/Xx	26	26	11,100	427·30	1,018·74	556·57	21·79	49·65	5·10
5/Yy	10·43	8·43	2,997	287·34	801·47	161·27	15·46	41·74	5·38
5/Aaa	19	18	9,810	516·31	1,307·96	495·66	26·09	64·98	5·05
5/Bbb	18	18	11,775	654·16	1,443·75	585·83	32·55	71·83	4·98
5/Eee	25·97	19·93	10,811	416·28	1,000·65	510·87	19·67	44·31	4·73
5/Hhh	14	14	9,810	700·71	1,371·89	404·00	28·86	57·13	4·12
5/Jjj	27	27	12,855	476·11	1,121·94	808·27	29·94	68·91	6·29
5/Aa .	21	19·80	12,693	604·42	1,329·88	555·69	26·46	57·17	4·38
5/Kkk	17	14·18	6,046	355·64	713·06	275·55	16·21	33·03	4·56
5/Lll	16	13·93	12,164	760·25	1,532·59	536·54	33·53	68·73	4·41
5/Rr	24·07	23·70	12,053	500·74	1,189·82	668·15	27·76	64·22	5·54
5/Mmm	32	29·60	23,455	732·97	1,505·40	1,117·47	34·92	71·13	4·76
5/Nnn	26	26	15,090	580·38	1,381·01	775·88	29·84	69·79	5·14
5/Ooo	23	16·83	15,047	654·22	1,506·13	688·73	29·94	66·29	4·58
5/Ppp	27·90	23·90	17,481	626·55	1,328·98	716·23	25·67	54·91	4·10
5/Qqq	30·70	29·80	16,842½	532·32	1,057·38	831·31	27·08	55·27	5·09
Means	26·77	24·59	15,281·36	570·75	1,257·89	765·57	28·59	62·32	5·00

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow March to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow March to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A	30	21·70	13,641½	454·72	3,943·34	695·94	23·20	200·82	5·10
9/C	16	16	11,400	712·50	4,902·18	488·12	30·51	208·44	4·28
9/D	32·60	19·40	12,405½	380·54	3,745·82	651·37	19·98	205·80	5·25
9/E	14·23	9·10	9,101	639·56	3,979·27	466·70	32·80	198·44	5·13
9/F	18	14	9,675	537·50	4,502·86	437·86	24·33	200·81	4·53
9/G	31·60	26·60	26,235	830·22	4,807·26	1,332·16	42·16	245·49	5·08
9/I	29	29	21,600	744·83	4,489·42	986·18	34·01	193·24	4·57
9/J	11	9·40	8,812	801·09	5,024·61	376·31	34·21	212·53	4·27
9/L	33	28·37	14,583	430·28	3,558·39	589·32	17·38	144·57	4·06
9/O	29·43	26·83	22,417	760·59	4,689·35	997·48	33·85	215·28	4·45
9/P	45	45	25,005	555·66	4,321·79	1,284·10	28·54	*220·84	5·14
9/T	20	18·73	16,236	811·80	4,174·78	710·11	35·51	189·07	4·37
9/W	28	15·10	13,334½	476·23	5,069·31	567·63	20·27	217·12	4·26
9/X	10·23	9·90	6,442	629·71	4,092·60	342·09	33·44	207·92	5·31
9/Y	10	8·40	7,086	708·60	4,650·93	282·90	28·29	188·80	3·99
9/Z	14	11·88	5,955	425·35	3,056·50	338·82	24·20	156·43	5·69
9/Aa	16·53	16·53	10,663	645·06	4,466·85	561·90	33·99	244·84	5·27
9/Bb	29·97	28·93	15,437½	515·08	3,429·60	719·47	24·01	170·74	4·66
9/Cc	17	16	9,435	555·00	4,756·68	514·10	30·24	253·70	5·45
9/Ee	35·90	35·37	18,432	513·42	2,660·75	903·59	25·17	131·07	4·90
9/Ff	4	3·80	1,707	426·75	2,261·55	70·61	17·65	84·40	4·14
9/Dd	17	14·30	7,953	467·82	2,416·82	349·67	20·57	114·25	4·40
Means	22·39	19·29	1,307·07	583·88	4,119·02	621·20	27·75	196·79	4·75

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1935.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow December to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow December to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B	18·70	18·70	10,593	566·47	6,259·18	556·22	29·74	318·51	5·25
6/C	22·10	21·10	17,346	784·88	7,051·17	855·68	38·72	310·67	4·93
6/Y	14·73	10·73	10,874	738·16	4,721·74	435·53	29·58	194·65	4·00
6/Ff	27·53	18·13	19,649	713·72	7,041·00	778·00	28·26	290·86	3·96
6/Kk	16·37	12·13	8,784	528·97	5,576·45	374·97	22·53	220·34	4·15
6/Ll	24·83	15·70	13,649½	550·45	5,368·29	466·22	18·80	191·79	3·38
6/Oo	20·83	18·70	19,844	952·66	7,714·04	798·70	38·34	323·96	4·02
6/Ss	17	13·67	16,391½	964·20	9,222·45	569·24	33·48	348·93	3·47
6/Tt	30·27	25·43	23,220½	767·11	7,829·87	974·14	32·18	327·60	4·19
6/Vv	31·50	27·60	27,645	877·61	8,620·95	1,223·80	38·83	396·30	4·42
6/Xx	26·93	20·10	18,865	700·67	7,356·48	754·28	28·01	297·02	4·00
6/Ccc	24	12	8,835	368·12	4,881·33	370·91	15·45	208·28	6·44
6/Ddd	24·08	18·57	19,511½	810·48	6,827·55	794·03	32·96	268·30	4·03
6/Jjj	24	18·73	15,111½	626·91	7,560·52	727·44	30·17	359·77	4·81
6/Mmm	9·87	8·87	6,119	619·96	8,022·35	267·11	27·06	362·41	4·36
6/Nnn	36·97	30·07	28,833	779,91	6,972·78	1,194·11	32·30	298·43	4·14
6/Ooo	32	27·43	27,619	860·18	5,542·90	1,135·32	35·36	228·26	4·11
6/Ppp	23·33	22·23	21,875½	895·98	5,427·97	819·00	34·34	213·65	3·83
6/Qqq	16	13·97	13,565	847·81	5,291·51	478·21	29·89	192·52	3·53
Means	23·24	18·62	17,254·26	742·56	7,255·90	714·34	30·74	305·89	4·14

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE OF LOWER NORTH BRANCHES.

The Conference of Lower North Branches of the Agricultural Bureau, held at Owen on 27th February, ushered in the first of the 1936 series of Conferences that are held each year under the auspices of the Agricultural Bureau of South Australia.

Delegates were present from most Branches in the district.

Mr. A. N. Freebairn, Chairman of the Owen Branch, presided, and the gathering was declared open by Mr. F. Coleman, of the Advisory Board of Agriculture.

The following papers were read and discussed:—"The Diesel Engine," Mr. F. W. Coleman (Saddleworth); "Fencing," Mr. A. Muegge (Rosedale); "Care of Sheep on the Farm," Mr. B. Moldenhauer (Whitwarta).

The agenda contained a large number of questions covering a very wide range of agricultural and livestock topics, which were answered by officers of the Department of Agriculture, including Mr. W. J. Spafford (Deputy Director of Agriculture), Mr. R. C. Scott (Supervisor of Experimental Work), and Mr. H. B. Barlow (Chief Dairy Instructor).

Conference accepted the invitation of the Wasleys Branch to hold the 1937 gathering in that town.

It was decided on the motion of Mr. E. Day (Wasleys), seconded by Mr. W. Hucks (Buchanan): "That when a crop is grown on the share system the following provisions in relation to prizes shall apply:—A joint entry may be made and any prize won to be divided between the owner-farmer and the share-farmer, unless either party refuses to share in the cost of entry, when the entry may be made separately by the owner-farmer or share-farmer, any prize to go to the party making the entry."

The evening session was occupied by an address illustrated with lantern slides, "A Tour of the Southern Hemisphere," by Mr. Spafford.

CONFERENCE OF YORKE PENINSULA BRANCHES.

ARTHURTON, 4th MARCH.

District Conferences of the Agricultural Bureau have been held for many years past at various centres on Yorke Peninsula, and, despite the fact that the Branch at Arthurton is one of the oldest Branches of the Bureau, this year was the first occasion on which it has sponsored a District Conference.

Under the supervision of an energetic Committee, and Mr. T. H. Howlett, the Secretary of the Branch, the Conference was one of the most successful that has been held on the Peninsula.

Mr. J. J. Hentschke, Chairman of the Arthurton Branch, presided, the opening address being delivered by Mr. F. Coleman (Member of the Advisory Board of Agriculture).

In addition to a large number of questions, which were answered by Officers of the Department of Agriculture, the following papers were read and discussed:—

"Improvement of Pastures," Mr. A. B. Ferguson (Arthurton); "Experience in Growing Peas," Mr. H. J. Cadd (Arthurton); "Destruction of Blowflies," Mr. L. Ford (Arthurton); "Horse Dipping," Mr. S. Pontifex (Paskeville).

Mr. F. Coleman presented the trophies to the successful competitors in the Northern Yorke Peninsula Crop Competition.

It was decided "That the 1937 Conference should be held at Stansbury on the third Wednesday in March."

"That any powder, &c., offered for sale for sheep dipping be compelled to conform to a Government standard." The General Secretary, at the request of the Conference, promised to publish a list of the sheep dips approved by the Stock and Brands Department in the *Journal of Agriculture.* "That this Conference recommends that in future any person or persons convicted of stealing wheat or other farm produce be more severely dealt with."

In the evening Mr. Spafford gave an illustrated address on "A Tour of the Southern Hemisphere."

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held at the Blackwood Experimental Orchard on 26th February, there being present:—Hon. A. L. McEwin, M.L.C. (Chairman), R. H. Martin, H. N. Wicks, A. J. A. Koch, F. Coleman, P. J. Baily, S. Shepherd, Dr. A. E. V. Richardson, and H. C. Pritchard (Secretary). Apologies were received from Messrs. G. Jeffrey, A. M. Dawkins, A. J. Cooke, J. B. Murdoch, J. W. Sandford, and Professor A. J. Perkins.

Life Members.—In recognition of 20 years' active membership the honour of Life Membership was conferred on Messrs. F. H. Wolf and G. C. Hienjus, of the Rosedale Branch, and H. A. Eckert (jun.), of Belvidere.

New Branch.—Approval was given to the formation of a Women's Branch at Yandiah, the following ladies being enrolled as foundation members:—Mesdames A. J. Kupke, W. C. Jettner, T. Giddings, E. C. Miechael, A. H. and S. R. Keller, B. H. and A. E. Borgas, D. Stirling, H. R. Neale, R. Llewellyn, and Misses V. and R. Keller and E. Sizer.

Conditional approval was granted for Branches to be formed at Cambrai and Echunga (Women's) with conditional re-organisation of the Meadows Branch.

New Members—The following names were added to the rolls of existing Branches:—Arthurton—Ed. Palin; Beetaloo Valley Women's—Miss Ida Pearce, Miss J. Halse; Belvidere—Glen W. McMillan, John Geo. McMillan, Geo. Brumfield; Coonawarra—Jas. L. Redman, Wm. Davis; Coonawarra Women's—Mrs. — Kamprod, Miss J. Brokensha; Currency Creek—Douglas J. Fergusson; Dudley—H. E. Wood, W. Blight, G. Mayfield, R. Blight; Ironbank—L. Clough, — Nottage, H. Henwood, Reuben Coates, T. Morgan, V. Morgan, A. Morgan, H. Morgan, L. Morgan; Karte Women's—Miss Audrey Trowbridge; Koolunga—Fredk. Reichelt, Glen B. Jones; Koonunga—Herbt. L. Heppner; Kybybolite—D. H. Irving; Lone Pine—Mick Madigan, Colin Lehmann; Mangalo—P. Briese, F. Munday; McLaren Flat Women's—Mrs. G. Hobbs; Mount Barker—A. E. Langrehr; O'Loughlin—Pastor A. Mueller, H. Gaden, R. Linke, T. W. Hedger; Penola Women's—Mrs. F. Fowler; Pinbong—L. A. Scholz, J. Guidera, E. C. Kemmerman, N. O. George; Redhill—Frank Simpson; Rosedale—Frank Noske, Harold Mather; Truro—H. K. Newell; Wasleys Women's—Miss P. Richter, Miss M. Perry, Miss J. Perry, Miss H. Perry, Mrs. H. G. Hancock, Mrs. W. Matters, Miss M. Matters, Mrs. G. Bahr.

Under the direction of the Chief Horticultural Instructor (Mr. A. G. Strickland) and the Manager (Mr. R. Fowler) members inspected the orchard and afterwards visited the packing shed of the Sturt Producers' Society, Ltd.

Several items were taken in Committee.

PAPERS READ AT CONFERENCES.

LOWER NORTH BRANCHES, OWEN, 27th FEBRUARY, 1936.

CARE OF SHEEP ON THE FARM.

[B. R. MOLDENHAUER, Whitwarta.]

One of the first and most essential things to consider in dealing with the care of sheep is the fodder problem, and with this is wrapped up the question of the carrying capacity of a farm. Conditions on different farms vary considerably, so that where one farm could carry a certain number of sheep another not far distant may be able to carry twice as many on the same acreage. Early-sown crops, such as barley or oats, help materially in the carrying capacity of a farm, and prove of great benefit for fattening lambs and keeping the ewes in good condition. But the farmer has to rely mainly on the knowledge he has of the state of affairs on his individual farm, and to regulate the size of his flock to the best of his judgment, bearing in mind that it is far better to be a little understocked than overstocked. Sheep that are being fed on land that is overstocked will not give the best returns as regards wool, or be in the best condition for rearing lambs.

The flock should have access to water all the year round, although during winter they may not require so much as in summer and could probably do without for a fairly long period, it is best to have it available so that sheep can get a drink at any time. The troughs should be of such a height that lambs can drink, and the troughs cleaned out occasionally. Clean water and plenty of feed are two essentials in raising or caring for sheep to get the best out of them.

Be careful when changing sheep into a different paddock after a rain at certain times during the year if stinkwort or clover is present. Milkweed is another plant which is very dangerous; especially if sheep are hungry and are turned into a fresh paddock.

Ewes in lamb or ewes with lambs should have the best feed so that the ewe will have the best chance to rear her lamb.

Crutch the sheep and clip the wool from their eyes if necessary. Young sheep especially are inclined to get wool blind, and if the wool is not clipped from their eyes they gradually fall away in condition, and if they have lambs they cannot look after them properly. Many ewes will not take their lambs for this very reason. Ewes should be crutched a while before lambing; this greatly reduces the possibility of the sheep being struck by flies, and the lamb is able to get a drink when born.

Uncrutched sheep get in a terrible state when greenfeed is young and sappy, and give flies every chance to wreak havoc with the sheep later on as well as spoiling a lot of fleece wool.

The blowfly is a pest that gives the sheepfarmer a fair amount of trouble at times during the year, and although sheep may be crutched it is necessary to go around the flock frequently to keep a sharp lookout for trouble of this kind, and treat the sheep affected with an effective solution that does not mat the wool.

At lambing time the ewes should not be disturbed too much, but kept under fairly close observation, and assistance rendered if necessary.

Shearing time is a period when sheep pass through a sudden change in the warmth of their coats, and if machines are used and one is unfortunate enough to experience wet and cold weather the sheep when shorn should be put where they can get most shelter. If at all possible a good plan is to shed them by night for two or three nights until conditions are better and the sheep become more accustomed to the cold. Late shearing has a disadvantage in that grass seeds are liable to get into the fleece, and not only spoil the wool, but irritate the sheep so that it will not do well.

Sheep should be dipped fairly soon after shearing. A little care and attention to sheep will be repaid by better all-round returns.

[Papers Read at Conferences.]

FENCING.

[A. MUEGGE, Rosedale.]

Unfortunately for the farmer there is always much necessary expenditure he has to indulge in to keep his property in working order. Not the least of these is fencing. The landowner who takes pride in his property at all will endeavour to erect suitable fences. Good fences not only keep the stock within the right side of a property, but add to the value of the farm in £ s. d.

A well-constructed fence is cheapest in the long run. The fence that most farmers in this district require is one that is both sheep and cattle proof. This means it has to be of reasonable height and the wires sufficiently close. It is the purpose of this paper to go into the costs of material for the different types and compare one with the other.

The following are only approximate prices, but at the same time they are from up-to-date catalogues of reliable warehouses and dealers:—

Wood posts, at £7 per 100 or 1s. 4½d. each (length, 5ft. 10in. to 6ft.).
Cement posts, £8 15s. per 100 or 1s. 9d. each (6ft. long).
Strainers, according to size, ranging from 3s. 6d. to 5s. each.
Wire, No. 10 gauge, 18s. to £1 per cwt., which is equal to ½ mile in length.
Wire, No. 12½ high tensile, 21s. 6d. cwt. or £1 4s. 6d. per mile.
Barb wire, £3 per mile.
Flat iron standards, £14 15s. per ton, or 585 approximately, 4ft. 6in. in length.
T-iron standards, £15 15s. per ton, or 425 approximately, 4ft. 6in. in length.

Ordinary fence of 1 barb and 5 plain wires with three standards between posts; 10ft. spacing; length, 1 mile; 3ft. 10in. high:—

	£	s.	d.
Wood posts, 124	8	14	0
Strainers, 8	1	10	0
Wire, 5/12½ H.T.	6	2	6
396 standards	9	16	8
Barb wire	3	0	0
Total	£29	3	2

With No. 10 wire in place of 12½ H.T., £3 17s. 6d. extra; with concrete posts instead of wooden posts, £2 5s. extra; total (approx.), £35 5s. 6d.

This fence may not be lamb proof and a little low for unruly cattle; a 7-wire fence with 2 barbs and 5/12½ H.T. wires with cement posts and standards spaced the same as the above fence should make an ideal stock-proof fence, and being fireproof it should stand for many years without repair. The cost for a fence of this description would be approximately £34 16s. per mile.

The fence with wooden droppers finds favour with many, because besides being cheaper should a horse or a cow lean on the fence there are no iron standards to be bent, and the fence will remain straight as before. The cost of the wooden droppers ranges between 18s. to 28s. per 100 according to size and timber, whereas using "star" or "corkscrew" spaced at 15ft.:—

	£	s.	d.
80 posts	5	10	0
264 standards	12	13	0
8 strainers	1	10	0
Total	£19	13	0

(Each "star" or "corkscrew," 11½d.)

The stronger the standards the more space can be had between posts, and it seems a matter of personal opinion which is better, as types such as "star" and "corkscrew" can be placed further apart, but these, of course, are that much dearer, which in turn makes the financial part of the fence about the same, as can be seen in the following example. In the fences that have been discussed posts were spaced at 10ft. using:—

	£	s.	d.
124 posts	8	14	0
396 standards	9	16	8
8 strainers	1	10	0
Total	£20	0	8

Patent fencing (similar to Cyclone) for 1 mile:—

	£	s.	d.
124 wooden posts	8	14	0
8 strainers	1	10	0
1 mile 5-wire patent	16	16	0
124 standards	3	5	6
1 barb	3	0	0
	£33	5	6
Second barb	3	0	0
Extra for concrete posts	2	5	0
6 wires instead of 5	2	17	6
	£41	4	0

With the 6 wires and second barb it should be stock proof, and an ideal fence, more so than the 5 wires, which have been known to let lambs through. The cement posts make it fireproof. Horses have been known to break and tangle this type of fence by pawing with their front feet, but this is rarely seen. This type (Cyclone, &c.) of fence is most assuredly the better fence for pigs, costing £45 per mile. It is much better than pig netting which cannot be strained, and young pigs seem to make holes in it or crawl under it, as it is comparatively weaker than these "patent" fences.

THE DIESEL TRACTOR.

[F. W. Coleman, Saddleworth.]

Before dealing expressly with the Diesel engine, as applied to the agricultural tractor, it is proposed to give a brief description of the working of this engine and trace the history of its progress.

The Diesel engine, also known as the Compression-Ignition (C.I.) engine, differs from the petrol engine in that during the suction stroke the latter draws in a cylinderful of air mixed with petrol, while in the C.I. engine the charge drawn in consists of nothing but air. In both the charge is compressed by the inward stroke of the piston. The higher the degrees of compression the greater the efficiency of the engine.

With the petrol engine the compression is limited because the charge consists of air mixed with fuel, which, when ignited by the spark, detonates if the compression is too great. In the C.I. engine the charge consists of nothing but air, so that the only limit to the degree of compression is the mechanical one of providing for the strain generated by the pressure.

By using anti-knock fuel petrol engines now have compression ratios up to 7 to 1, but the C.I. engine can use ratios up to 17 to 1, consequently the latter is more efficient than a petrol engine.

The principle of the C.I. engine is that the air is compressed to a degree required for spontaneous ignition, then towards the end of the compression stroke a measured quantity of fuel oil is injected into this highly heated compressed air charge where it is instantly ignited and completely burned, providing the fuel oil can be injected in a proper form and state and have sufficient air necessary to burn it. This principle enables low-priced fuels to be used, and with the high thermal efficiency obtained less fuel is consumed per horsepower generated.

Figures show fuel consumption as low as .37lbs. fuel per brake h.p. hour.

HISTORICAL.

Rudolph Diesel was born in Paris in 1858, and was drowned from an Antwerp-Harwich mail steamer on 30th September, 1913. In 1893 the first Diesel engines were built of both four-cycle and two-stroke designs. A compression of 500lbs. was used, and the fuel was injected by a blast giving 1,000lbs. per sq. in. This was efficient but too costly.

Semi-Diesels using a hot bulb or hot spot were then used for a time, but in 1924 Vickers-Petter turned out an engine of 500 h.p. running at the slow speed of 250 r.p.m. Fuel with a flash point of above 150° F. was pumped into a water-cooled chamber. By 1925 all the British marine engine companies were using some Diesel engines. Ships equipped with these engines showed a thermal efficiency of 40 to 45 per cent. over the 20 to 25 per cent. with steam. The fuel bills were found to be about half that of an oil-fired burner for steam. Other advantages in a ship were the saving of space and personnel.

Diesel-Engined Tractor on F. Coleman's Property, Saddleworth.

In 1926 1,000 h.p. engines were being installed in locomotives and rail cars, the drive usually being taken through electric generators. The Diesel engine put in the South Australian rail car gives a mileage of 9.52 m.p.g. against 4.1 when petrol was used on the same run. The Municipal Tramways buses show 10.8 as against 5.7 m.p.g. with petrol and 17.5 against 7 m.p.g. with petrol. The Tramways have saved £230 in 7 months. A 5-ton Albion truck operating on a run of 59 miles from Melbourne used to cost 9s. 6½d. for the run using petrol as fuel, but can now do it for 2s. 0½d. with crude oil. Five-ton trucks running from Mount Gambier to Melbourne run at a fuel cost of ½d. per mile using Diesel engines. Tests in England also show 14 m.p.g. against 8.4 with petrol, or .43d. per mile against 2.1d. A Lagonda car with Diesel engine on a trip through Wales reached speeds up to 83 m.p.h., and averaged 42 m.p.g. of fuel. A Cummins car in 1931 at the Indianapolis Speedway averaged 86 m.p.h. for 500 miles, and was the only car in the race to complete the course without a stop. Capt. Eyston has reached a speed of 120 m.p.h. on another racing track with a Diesel-engined car.

Bus companies' tests have shown that overhauling is necessary only after having done 30,000 miles running. Diesel engines will run for three times as long as petrol ones before decarbonising and valve grinding are necessary. The Birmingham Corporation has over 100 passenger buses equipped with 5 cylinder Gardner Diesel engines.

The main advantages then of the Diesel engine are:—

1. Low running costs.
2. Slow speed engines.
3. High overload capacity.
4. Absence of electrical gear.

The advantages of the Semi-Diesel are that they can be made lighter, and starting is simplified by the use of a heating lamp.

Diesel engines in stationary power units show on a pumping plant that 9,700,000galls. could be pumped for £15, or less than ½d. per 1,000galls., when electric pumps cost 1d. per 1,000galls.; 250 tons of rock was crushed to 1¼in. in 10 hours for 17s. worth of fuel. Diesel-powered refrigerators will make ice for 1s. 6d. per ton. A wide range of fuels can be used, and fuel can be obtained if necessary from brown coal.

DIESEL TRACTORS.

One of the first Diesel tractors to make its appearance in South Australia was the one-wheeled drive, 2 cyl. *Benz*. The engine running at 800 r.p.m. developed 30 h.p.—a powerful tractor using 1½galls. of fuel per hour, but the design was found to be unsatisfactory for South Australian conditions.

This tractor was followed by the *Lanz* Semi-Diesel single cylinder which is started by heating the cylinder head with a lamp. Running at 500 r.p.m. on the two-stroke principle, 30 h.p. is developed at the belt and 15 at the drawbar; 1½ to 1¾galls. per hour of fuel are consumed under load, and lubricating oil was used at the rate of 1gall. per 10-hour day. It gave a drawbar pull of 2,800lbs. The *Imperial*, an Australian-made machine, works on the same principle as the Lanz. It has a large bore (9¼in.), which is ⅜in. more than the Lanz, and develops 36 h.p.

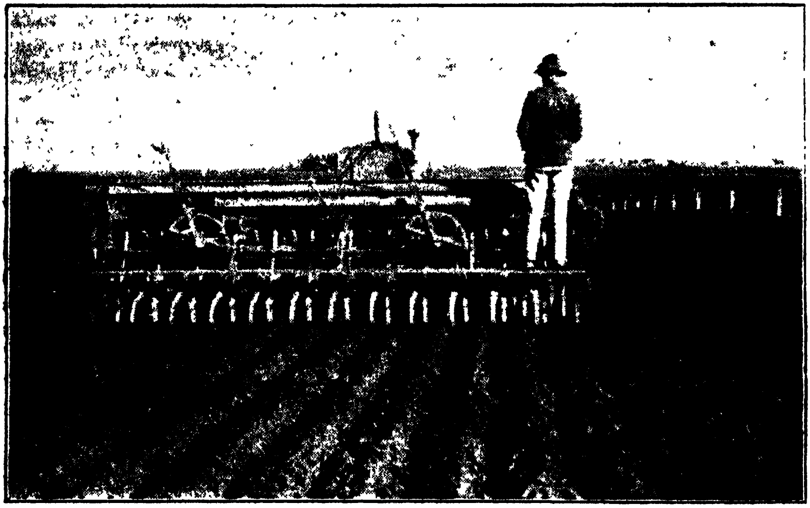
The *Avance*, with a 2-cylinder 2-stroke engine, with an engine speed of 625 r.p.m., was a very powerful tractor. A compressed air cylinder on the machine used in conjunction with a blow lamp made starting easy. This machine had a self-locking differential which prevented slippage on one wheel in soft patches.

The *Benz* then brought out a 4-wheeled tractor with a single cylinder working on the 4-cycle principle. The engine ran at 800 r.p.m., and gave 26 h.p. at the belt. The horsepower at the drawbar, however, was lower than the other makes, and was suitable only for small farms. The initial cost, however, was prohibitive so far as the small farmer was concerned, but the principle of operation was good. It starts from cold, a compression lever being used. Fuel is injected under 900lbs. pressure into the pre-combustion chamber. Under load only 1gall. of fuel is used per hour, and savings up to 75 per cent. in fuel are obtained. This would be the ideal tractor for the small farm if it could be produced at a competitive price.

The *Caterpillar* Tractor Co. produced their first Diesel in 1931, and up till 1st November, 1935, had turned out 9,000 Diesel engines, 7,000 of which are operating in tractors. Four models are now being made by this firm with Diesel engines with drawbar horsepowers of 95, 60, 45, and 35. The three larger models run at low engine speeds, 820 to 850 r.p.m., and are full Diesels with a compression ratio of 14 to 1, and of 4-cycle design. Aluminium alloy pistons with 8 rings each are of the same size for the three models, the "45" being a 3-cylinder engine, the "60" a 4-cylinder, and the "95" a 6-cylinder. The larger models have 6 forward speeds ranging from 1.7 to 5 miles per hour.

The 1934-5 model of 40-46 h.p., now popular in South Australia, has 4 forward speeds, and in low gear (1.7 m.p.h.) has a drawbar pull of 10,400lbs. It weighs 6 tons, and with standard 16in. shoes has a ground pressure of 6.2lbs. per sq. in. Under load the fuel consumption is 1½ to 1¾galls. per hour, and lubricating oil 4¾ pints per 10-hour day. All models use an auxiliary petrol engine for starting, which usually takes about 4 minutes in the morning, using about 1 pint of petrol.

The *McCormick Deering* T40 Tracklayer is of similar power to the Caterpillar 40. At low gear (1.7 m.p.h.) a drawbar pull of 10,900lbs. is given. It is a 4-cylinder 4-cycle engine with a compression ratio of 15 to 1, and travels at 1,100 r.p.m. It weighs 5½ tons, and with 16in. shoes has a ground pressure of 5.4lbs. per sq. in. The starting arrangement is very ingenious, the 4-cylinder motor being converted into a petrol motor by opening a port in the cylinder, thereby lowering the compression ratio and bringing in the spark plugs for firing, all other working parts being common to both engines. After starting on petrol, the change over to Diesel operation is automatic, and is made after a given number of engine revolutions. Auxiliary engines and batteries are thereby eliminated for starting.



The Diesel Tractor hauling a 26-hoe Combine.

The *Cletrac* 40, a 6-cylinder 4-cycle engine of 46 drawbar horsepower, gives a drawbar pull of 9,600lbs. at 1.8 m.p.h. The engine travels at 1,200 r.p.m., and has a compression ratio of 14 to 1. This tractor weighs 5 tons, and with a 15in. shoe has a ground pressure of 5.9lbs. per sq. in. The engine is a standard Hercules Diesel, as is also being used in Diamond T, White, Federal, and G.M.C. trucks. Starting is from cold by means of batteries.

During the last two months two new Diesel tractors have been placed on the South Australian market.

The *McCormick-Deering W.D.* 40 has the same engine as the tracklayer but it propelled by wheels. The advantage in this model is the lower cost price to the user. These sell at between £700 and £800.

The other make which will not be out here until June, 1936, is the *Caterpillar R.D.* 4 of 35 drawbar horsepower. It will be of different design to the 3 larger models, being a 4 cylinder of 4¼in. bore, the "40" having a 5¼in. bore and only 3 cylinders. It will also run at a much higher engine speed, viz., 1,400 r.p.m. The drawbar pull at 1.7 m.p.h. is 8,500lbs., the weight 4¼ tons, and with 13in. shoes has a ground pressure of 5.9lbs. per sq. in. Five forward speeds are provided being 1.7 low, 2.4, 3.7, and 5.4 m.p.h. in high. Price, £850 to £900.

When considering the purchase of a tractor the following points should be borne in mind:—

1. The need for a tractor.—Be satisfied that the tractor will make definite savings in the work to be done.

2. Purchase price.—If heavy continuous work is demanded, long life and low cost of upkeep must take first consideration.

3. Ability to do better work.—A tractor that will not do the work as well or better than the power being used is of no use.

4. Versatility.—It must be able to do all kinds of work demanded.

5. Reliability.—It must be able to carry on with the job when conditions are right. There must be a good backing to the machine, and parts should be available when required.

Horsepower is worked out on the basis that 1 h.p. will lift 33,00lbs. 1ft. in 1 minute. A tractor travelling at 2½ m.p.h. equals 220ft. per minute, so that 40 h.p. equals 1,320,000 ft. lbs. of work. Divide the ft. lbs. by the speed in feet per minute, which gives the lbs. pull—40 h.p. then equals 6,000lbs. pull. The gradient also affects the pull; 1½ per cent. of the total weight of the outfit must be deducted from the effective pull for every 1 per cent. of gradient. Wheel tractors have less parts than the tracklayers. The grips on the wheels, however, offer more resistance to the propulsion of the machine, and less percentage of engine power is made available at the drawbar for pulling. Field tests at Nebraska show that 7 popular makes of wheel tractors gave 70.3 per cent. of power at the drawbar while 7 tracklayers gave an average of 81 per cent. A 1,500lbs. horse walking at 2½ m.p.h. and exerting a pull equal to one-tenth of its own weight gives a pull equal to one drawbar horsepower.

A 2,000lbs. horse would then pull 200lbs. or 1.33 h.p. Petrol and kerosene burning tractors consume about 1lb. of fuel per h.p. hour under rated drawbar load, whereas Diesel tractors use less than ½lb. of fuel per h.p. hour.

OPERATING COSTS.

In conclusion, the following statement shows the working costs of a tractor at Saddleworth for 6 years. In March, 1930, we purchased our first tractor, a petrol-kerosene burning tracklayer of 15-20 h.p. for £470 landed on the farm. After working for 3,436 hours of operating time in 5 years was sold for £280 in 1935.

Costs for 5 years' work were as follows:—

	£		s.	d.	
Fuel, oil, and repairs	449	or	2	7	per hour
Depreciation at 10 per cent. and interest at 5 per cent.	295	or	1	8	per hour
Labour—Operating at 1s. 6d., plus 10 per cent. for overhauling, greasing	283	or	1	7	per hour
	£1,027	or	5	10	per hour

In January, 1935, a 40 h.p. Diesel tracklayer was purchased costing £1,100 delivered at the farm. During the 12 months the tractor has been operating for 1,280 hours, the following farm operations having been performed:—

	Acres.	
Cultivating	1,854	
Seeding with combine	689	
Ploughing	381	
Disc ploughing	134	
Harrowing	1,018	
Pea harvesting	93	
Dam sinking	—	52 hours
Total	4,169	

The costs of operating for the year are as follows:—

	£ s. d.	Per Hour. s. d.
Diesel fuel oil, 1,866galls. at 7¾d.	60 7 0	1 0
Petrol starting, 35galls. at 1s. 6d.	2 13 0	
Engine oil, 70galls. at 5s.	17 10 0	0 6
Gear and track roller oil, 50galls. at 5s. 2d.	13 0 0	
Kerosene for cleaning, 10galls. at 1s.	0 10 0	
Repairs	Nil	estimated 3d.
Depreciation at 10 per cent. on £1,100	110 0 0	2 0
Interest, 3 per cent. on £600 (average depreciation value)	18 0 0	
Labour—Operating at 1s. 6d., plus 10 per cent. for overhauling, greasing, &c.	106 0 0	1 7
	£328 0 0	5 4

A comparison of costs of farm operations with tractor costs only show:—

Operation.	Fuel cost only. Petrol. s. d.	Fuel cost only. Diesel. s. d.	All costs. Petrol. s. d.	All costs. Diesel. s. d.
Ploughing with 5 and 10 furrow ploughs ..	2 0	0 7	6 0	3 0
Cultivating, 9ft. and 14ft. machines	0 11	0 2¼	2 9	1 4
Harrowing, 10 leaves, 33ft.	0 2	0 0¾	0 7	0 4
Pea harvesting, 6ft.	1 9	0 8	5 8	5 0

The actual savings made on the farm by the 15-20 h.p. petrol tractor for the 5 years was £379. In 1930 and 1931 18 horses were sold for £149. The cost of keeping them for the 5 years was £144 per annum. Costs per horse at £8 made up as follows:—4 tons of chaff and hay at 30s. = £6; grazing at £1, and stabling at £1 per head. The wages for an extra man 9 months at £12 per month, £108 per annum, was also saved for 4 years. Total savings:—Sale of horses, £149; upkeep of horses, £144 for 5 years = £720; and wages, £432; total, £1,301. Against this is cost of tractor, £473, plus £449 for running costs, making a total of £922, a net saving of £379.

The final table shows the estimated savings of the Diesel 40 over 15-20 petrol tractor and a 10-horse team for 5 years:—

	£
Sales 7 horses and harness	150
Sale 15-20 tractor	285
Wages 1 man at £144 per annum 5 years	720
Upkeep 7 horses at £8 per head 5 years	280
Upkeep 15-20 tractor £150 per annum 5 years	750
Total sales and savings	£2,185
	£
Cost Diesel, freight, and extras	1,100
24-hoe combine exchanged for two 16's	35
10-furrow plough exchanged for 2 old ones	70
Cost of operating, fuel, oil, and repairs at £110 per annum, 5 years	550
Net savings in 5 years	430
	£2,185

At the end of this period, however, we have still our plant which has another 5 years to run before the depreciation will have run out, so that it can be estimated that by 10 years savings equal to £1,960 will have been made. This means that the Diesel makes savings equal to £196 per annum.

[*Papers Read at Conferences.*]

YORKE PENINSULA, ARTHURTON, 3rd MARCH.

IMPROVING THE PASTURES.

[A. B. Ferguson, Arthurton.]

During the last four or five years wheatgrowing has proved to be far from profitable, and the man on the land has had to look to some other means of profitable production. Stock raising, especially sheep and fat lambs, has proved a great help in trying to balance the budget; also cattle. It would be safe to say that where one cow was milked on the farm 6 years ago there are 5 milked to-day. All this means that the natural carrying capacity of the land has been more than utilised, and as a consequence attention has been directed to increasing the carrying capacity by artificial means, such as top dressing and fodder crops. During recent years prices for wool have not been encouraging. Fat lambs were good, but fat lambs cannot be produced without an abundant supply of early feed. This year the price for both wool and lambs is good, and the season has been most favourable. It is not often that farmers experience such good seasons and prices as has been the case this year. Therefore, the improving of our pastures in average seasonal conditions is a point that should be kept in mind.

Let us consider the question from local conditions. What would be suitable in a country with a 20in. to 25in. rainfall would not be suitable here, where the fall is from 15in. to 17in. The land of this district is devoted almost wholly to cereals, and it is only the land lying out that can be utilised for pastures. The question is: How to utilise that land to the best advantage for grazing stock, whether it be for large cattle or sheep?

The first suggestion would be a heavy dressing of super with the cereals, whether that crop be wheat, oats or barley. Possibly, by force of circumstances, farmers have been practising false economy by using too light a dressing of super, and therefore results from crops are not so good; neither do the stock get the advantage of the feed that would naturally follow a heavy dressing of super. The cereal crop will only use the amount of super it requires; anything over and above that goes to increase the carrying capacity of that land when left out for feed.

The second suggestion would be to sow Cape barley, rye, or oats—preferably Palestine oats; they grow quickly, and would stimulate the land for the next wheat crop. The oats, if sown on stubble, should have at least 60lbs. of super per acre; if on grass land, 70lbs. to 80lbs. Peas are a profitable fodder crop, especially for fattening summer lambs, and would come in when the oat and barley crops were eaten out.

In the June issue of the *Journal of Agriculture* there was a very extensive article written by Mr. R. L. Griffiths (Agricultural Instructor) on increasing the stock-carrying capacity of the mallee farms. He advocated the encouraging of various clovers, of which there is a great number of varieties. Also, he advised the sowing of lucerne, Wimmera Rye grass, King Island Melilot, Evening Primrose, and Early Subterranean clover. Whatever the success or otherwise of these plants, they would be well worth a trial. Just how these plants would affect the land for cereal growing it is difficult to say. Some are already looking on Wimmera Rye grass with suspicion, the idea being that it robs the wheat plant. Attention should first be given to encouraging natural grasses and clovers. It is surprising the number of different clovers that appear after a few liberal dressings of super. The more these can be encouraged the more fertile will the land become. These plants being nitrogenous, it is impossible to estimate the value of them to the land.

Any improvement of pasture must be backed up by the conservation of fodder, because any breakdown in the season may leave us stranded if there is not a good supply of hay, silage, oats or barley stored away to meet any emergency of seasonal conditions.

Every farmer should study his own conditions, and see that every foot of land not under cereal crops is prepared to carry as much stock as possible. Small paddocks close to the house, races, and every small corner should be utilised by sowing with Cape barley and a liberal dressing of super. Stable manure may be all right, but it has a tendency to produce too many useless weeds.

EXPERIENCES ON GROWING PEAS.

[H. J. CADD, Arthurton.]

The pea crop has proved to be most useful and successful, especially if the season is average, or a little better.

The plant revels in light to sandy soil, and if reasonable care be taken in the preparation of the seed bed, the crop will usually return a good margin of profit. Naturally, peas sown on fallow do well. Locally, it is not usual to follow this practice to any extent, generally following barley or wheat with a crop of peas.

Graze the stubble as hard as possible; then during autumn cultivate until a fairly fine surface occurs. When weeds have germinated following the opening rains, again cultivate. This practice leaves the land in a good condition. When the proper time for sowing arrives the combine will effectively deal with any weeds that have germinated since the last cultivation.

June is the most satisfactory month for sowing in this locality. This is rather earlier than farmers sow in recognised pea-growing districts. Excellent results have been obtained from sowings made in May; July, on the other hand, has invariably proved to be too late. The plant appears to have insufficient time to properly mature before warm weather occurs.

Nothing less than 1½bush. to the acre should be sown; if using Brunswick Whites, up to 2bush. can be sown with advantage. Duns can be sown a little lighter. I would not, however, suggest less than 1½bush. to the acre.

Many farmers have given up growing peas because of the prevalence of grubs. This pest in recent years has been particularly destructive in the "Dun" crop for the reason that this variety happens to be in the green pod stage just at the time that the grub is about. The Brunswick variety has the advantage of ripening a couple of weeks earlier, and is, therefore, more or less proof against damage by grubs. Of the two varieties named, the Dun is much the stronger grower, and if the grub menace is escaped, will yield the heavier crop. The Brunswick, however, can always be relied upon to return a fair crop.

The crop has been grown principally for fodder purposes. A good crop—say, 7 to 9 bags—will fatten 8 to 10 sheep to the acre, and is particularly suitable for topping up lambs. Aged ewes also do well on peas. Great care must be exercised when first turning sheep on the crop, otherwise many casualties will occur. Begin with an hour or two, and gradually lengthen the time from day to day, until full time is reached. The sheep should always be removed from the peas if the weather is wet, and not allowed to return until the peas are dry. Never begin grazing the crop until it is thoroughly ripe.

There is little doubt that the sheep-carrying capacity of the average farm could be substantially increased if the sowing of peas was more generally practised, which in turn would mean more profit to the farmer, especially with wool and fat lambs at the good prices now ruling.

Where the rainfall exceeds 15in. peas can, in some measure, take the place of bare fallow, the major difficulty being to properly cope with weeds. Instead of the practice that has become somewhat extensively adopted during recent years of cropping fallow with wheat, burning off the stubble the following autumn, then winter fallow, and sown to wheat the following season, peas could be successfully grown on a portion of the stubble land.

If the practice became general among farmers, it is possible that less wheat would be grown per farm—a very desirable result in a time of over-production and depressed prices. The average production, however, is bound to rise, due to the improved condition of the soil.

Wheat following wheat is more or less a process of mining the soil, whereas rotation of crops is farming. The good farmer aims at the building up of his soils rather than impoverishing them.

The pea crop will add valuable elements to the soil, chief among them being nitrogen. Much of the land is lacking in this essential plant food.

The heavy grazing which follows not only enables many sheep or lambs to be fattened. but the land is put into a much improved condition by the droppings and urine from the sheep. This is a marked contrast to the condition of some of the lighter soils, particularly those that are being subjected to heavy wheat cropping, coupled with continual fallowing; and last, but not least, the heavy loss that is going on yearly by erosion alone.

HORSE-DIPPING.

[S. PONTIFEX, Paskeville.]

In common with many other animals, horses have parasites that infest them and cause considerable distress and discomfort. Gradually farmers have realised the necessity for preventive measures to allay the irritation. It is only 20 or 25 years since "horse itch" was observed in these districts, but it has now become so prevalent as to cause much worry and expense to horseowners. My horses have been dipped annually the last four years, and the fencing repairs saved would pay for installing a private dip.

The need for dipping horses was frequently brought up at Bureau meetings, and eventually a committee was formed to construct and operate a horse dip in conjunction with a sheep dip at Paskeville, on district council property. The first important question was that of finance. About 20 farmers were approached, and subscribed £1 each, on the understanding that their first 8 horses would be dipped free. Later the committee arranged funds at the bank to complete construction costs, and to-day the dip is operating quite successfully.

Cooper's Milk Oil Fluid is used, at a strength of about 1 in 100, and so far it has been found possible to continue operations by charging 2s. 6d. per head, after paying for the fluid and caretaker's fees and general maintenance.

Horses are dipped at the owner's risk, and a notice is posted up to that effect; but in practice there is very little danger. Precautions should be taken against dipping horses when warm; their temperature should be as near normal as possible. Extra care should be observed on the homeward journey to prevent overheating.

At first dipping was done just prior to hay-making, but this has been changed to February of each year, and it has proved the most convenient time. Teams and men are usually on slack time at that period of the year, and there is less bother with the mares.

Owing to the fact that the sheep dip was put down some years ago, it was necessary to construct a separate horse dip, but either sheep or horses could be dipped in a horse dip. The dip is approximately 50ft. long by 3ft. wide, and allows for 3ft. of fluid, with sloping ends. This is long enough to stand 6 horses in at one time, and they can be effectively dipped at the rate of 12 an hour, giving each horse the prescribed time of 20 minutes.

Some people claim the parasites can be eradicated by scrubbing and applying the dip by hand, but this method is laborious and dangerous to the operator, and very wasteful.

Where a community dip is not available, a private dip could be put down cheaply, just big enough for 1 horse to stand in, with only 1 sloping end, and the horse backed into position.

It is advisable to make the dip as small as possible on account of the high cost of a reliable dipping mixture, and once charged all dipping should be completed as speedily as possible owing to evaporation or contamination or rain upsetting the strength of the dip.

The question has been raised, "How often is it necessary to dip?" Some claim that once horses are free there is no need to dip for some years, but contamination takes place either in old yards or sheds, or by other horses. It is preferred to dip as a preventive measure, rather than wait until a drastic cure is necessary.

Farmers should dip their horses as frequently as the need arises, for their appearance is much enhanced, and they carry condition much better on account of being able to feed undisturbed.

THE DESTRUCTION OF THE BLOWFLY PEST.

[L. FORD, Arthurton.]

The only sure method of dealing with the blowfly pest is by destroying the fly, and stop it from breeding, and this can only be attained by trapping the fly. Jetting and crutching are expensive, and are not entirely satisfactory. It is a known fact that the fly blows three or four times during its life, and by trapping this is prevented.

(Mr. Ford exhibited a trap which was made of glass with a wide open neck at the top, and the bottom turned inwards and upwards for a few inches with a wide mouth and lip. The method of its operation was to place it on a kerosene tin which had a circular hole about 6in. in diameter in the top of the tin). When this was done place a generous amount of stale liver (or other meat) in the tin, and pour in about a quart of water to moisten the meat, and thus make a better bait.

Fill the trap with water to within ½in. of the inside lip, and place gently on the prepared tin, the four small legs of the trap itself fitting exactly into the four corners of the tin. Place a small tin or piece of bagging or cloth over the open top of the trap, and everything is ready for catching. It should preferably be placed in a shady place near the sheep yards or watering places, as the flies are usually more prevalent in these places; but good catches can be made anywhere around the sheds or paddocks.

The trap usually only needs baiting once, as once the bottle gets full of flies the dead become the bait, and are by far the most effective of all.

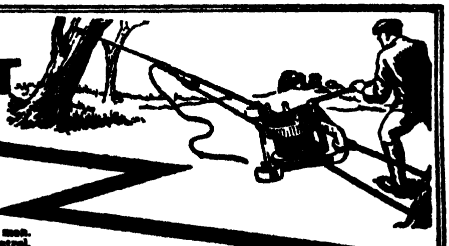
When the trap is catching flies leave it, even if brimming over, until the flies start to blow their own dead inside the bottle; then empty it into a fresh tin with a hole cut in the top, as with the first tin. Rinse out the bottle into the tin, and place again on top, filled with fresh water.

The first tin can now have its contents destroyed, either with boiling water and caustic soda, or by sprinkling lightly the inside of the tin with any arsenical sheep dip powder, and the tin placed on one side. When the bottle is again full the first tin can be rinsed out and used again.

It is fatal to use kerosene anywhere near the trap. Should there be a number of live flies in the bottle when it becomes necessary to empty it, use a small amount of petrol poured through the bagging on the top outlet of the bottle. This soon kills any live flies, and evaporating quickly, does not interfere with the smell of the dead flies.

There is also an alternative method of using the trap. Place it on a piece of board flat on the ground. Fill the trap as usual with water, and add to the water

TEARING THEM OUT



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in the trap a piece of sodium sulphate, roughly about 1in. square. This will readily dissolve, and turn the water a greenish colour, and the odour given off is attractve to the flies. When the trap becomes full, empty the trap and repeat as usual.

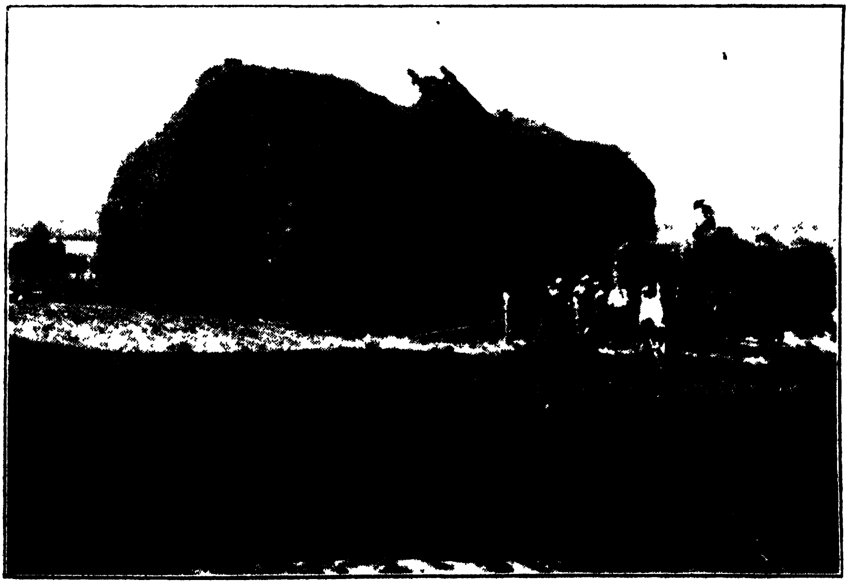
These traps are being used by a number of leading sheep farmers on the Peninsula, and are giving most satisfactory results. They are unanimous in saying that if these traps were used on every farm in a district the fly nuisance would be considerably checked, and eventually made so small that farmers would have to spend much less time on their respective flocks.

At the beginning of summer, when the blowfly pest seems to be at its worst period, I set a couple of traps on a neighbouring farm. Within three days I visited the farm, and found the traps full to the brim with flies of all descriptions, including several bot flies. The majority of the flies were the dangerous green fly, and these were all blowing their own dead, showing how quickly they breed. We emptied these traps and destroyed the flies, and in two days they were full of flies again.

The chief breeding grounds of the flies appears to be the dead carcasses lying about the farms. Many farmers are very neglectful of their duties in this respect. Every dead animal should be either burnt or buried immediately. Follow this practice up by installing some recognised blowfly traps, then the blowfly menace would be considerably reduced, which means added profits to the farmer.

RIVER MURRAY SWAMP AREAS—FIELD DAY.

There was a particularly good attendance of settlers from the irrigation districts in the vicinity of Murray Bridge, when the Annual Field Day of the River Murray Swamp Areas was held on Messrs. H. W. Morphett and Co.'s property at Wood's Point.



Stacking Meadow Hay, Woods' Point Field Day, February 20th.

Mr. H. H. Jericho (Chairman of the Jervois Branch of the Agricultural Bureau) introduced visiting officials and speakers for the day and thanked Messrs. Morphett and Co. for placing their holding at the disposal of the Bureau. The Hon. A. L. McEwin, M.L.C. (Chairman of the Advisory Board of Agriculture), opened the proceedings, and addresses, amplified with a loud speaker, were given by Messrs. W. J. Spafford, H. B. Barlow, and C. F. Anderson, of the Department of Agriculture, Mr. R. Baker of Roseworthy Agricultural College, and Mr. H. Trumble, M.Sc., of the Waite Research Institute. Mr. P. J. Baily, Manager of Wood's Point and a member of the Advisory Board, also gave a short address in which he outlined some of the general practices adopted in the management of the swamps.

River Murray Swamp Settlers' Field Day, Woods' Point, February 20th, 1936

MEDITERRANEAN GRASS.

[*Desirous of ascertaining the origin of Mediterranean Grass, its distribution and use throughout the world, Mr. R. L. Griffiths (Agricultural Instructor) forwarded samples of the plant and seed to the Director of the Royal Botanic Gardens, Kew, England. Below is a statement which Mr. Griffiths received in reply.*]

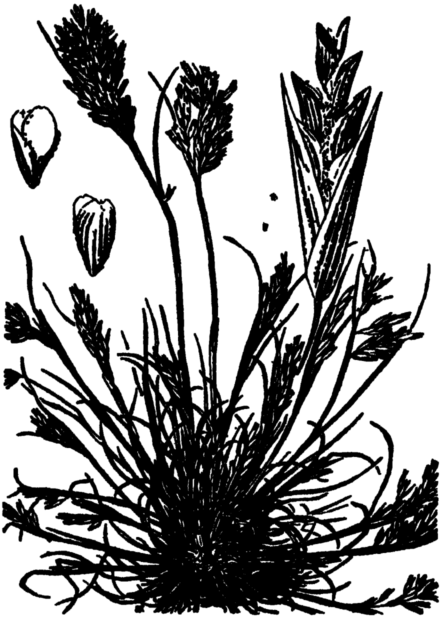
Name.—*Schismus barbatus* (L.) Thell.

Synonyms.—*Schismus calycinus* Duval-Jouve, *S. fasciculatus* Beauv., *S. marginatus* Beauv., *S. brevifolius* Nees, *Festuca barbata* L., *F. calycina* Loefl., *Koeleria calycina* DC.

Distribution.—A native of the Mediterranean region, extending from the Iberian Peninsula and the Canary Islands through the coastal regions of Southern Europe and Northern Africa to north-west India and Central Asia. Also in South Africa, where a variety of forms occur. Introduced into the United States, Argentina, Western Australia, South Australia, Victoria and New South Wales.

Ecology.—In the Mediterranean region it is of frequent occurrence on maritime and river sands, in cultivated fields, field-margins, paths, roadsides, dry grasslands, wall-tops. It occurs from near sea-level up to 1600 m. in the lower parts of mountains.

Economic Uses.—In its native habitat this species is usually regarded as of little value, but as it grows in areas of low rainfall where many of the grasses are tough and unpalatable, it must provide a certain amount of grazing. It seems to be of greater use in the countries where it has been introduced. In the southern part of the State of Arizona (U.S.A.) it has become locally dominant, having spread quite rapidly (in the open ground), along roadsides and dry river beds. It is stated to be an excellent winter forage grass, growing during late winter and spring months, and with irrigation remains green and continues growth throughout the summer season.



Mediterranean Grass (*Schismus barbatus*).
Plant x ½: Spikelet and Florets x 5.
[*From U.S. Dept. of Agric., "Manual and Grasses," by A. S. Hitchcock.*

Habit.—An annual or short-lived perennial from 2-15ins. tall. It produces numerous very slender culms and fine leaf-blades, contracted panicles and an abundance of seed.

ALMOND TREES DYING.

A member of the Greenock Branch of the Agricultural Bureau states that in the 1935 planting season, a number of almond trees were planted where they would receive the drainage from horse stables. The trees originally made good growth, but subsequently all have died. Mr. A. G. Strickland, M.Sc. (Chief Horticultural Instructor), to whom this question was referred, says:—"Fresh drainage from horse stables should not be applied to growing plants, as the material may contain compounds which are toxic to plant growth. For instance, farmyard manure of any sort should be rotted down before application to young trees. From another viewpoint, it is noted that almond trees are most intolerant of 'wet feet'; if the volume of drainage is sufficient, or the location of the trees such that they were subjected to waterlogged soil conditions, this factor alone would be sufficient to account for death."

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.	
B Cooke, Kanmantoo	1	161	
	2	135	
	3	182	418
	4	177	
	5	208	●
	6	181	566
			984
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	182	
	14	—	
	15	176	358
	16	206	
	17	163	
	18	89	458
			816
H. F. Muirson, Yundi.	19	—	
	20	159	
	21	82	241
	22	147	
	23	197	
	24	58	402
			643
E. McKee, 5, Rose Street, Carrondown.	25	175	
	26	—	
	27	231	406
	28	212	
	29	204	
	30	195	611
			1,017
H. C Stacy, Meadows.	31	88	
	32	116	
	33	175	379
	34	82	
	35	173	
	36	222	477
			856
T Cleaver, Bridgewater	37	114	
	38	153	
	39	94	361
	40	178	
	41	147	
	42	165	490
			851
C Sandstrom, Yundi.	43	173	
	44	dead	
	45	dead	173
	46	84	
	47	108	
	48	146	338
			511

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936	
A. J. Monkhouse, Woodside.	49	83	
	50	168	
	51	192	443
	52	214	
	53	122	
	54	191	527
			970
J. F. Smith, Meadows.	55*	160	
	56	131	
	57	10	310
	58	158	
	59	55	
	60	176	389
			699
A. Young, Bridgewater.	61	187	
	62	179	
	63	171	537
	64	131	
	65	204	
	66	164	499
			1,036
R. W. McAlister, Yundi.	67	99	
	68	157	
	69	156	412
	70	143	
	71	91	
	72	179	413
			825
T. Duhring, Mallala.	73	207	
	74	—	
	75	158	365
	76	80	
	77	82	
	78	111	273
			638
R. J. Underdown, Meadows	79	54	
	80	121	
	81	184	359
	82	147	
	83	118	
	84	189	454
			813
S. Hill. Bridgewater.	85	157	
	86	197	
	87	153	507
	88	196	
	89	197	
	90	172	565
			1,072
W. R Hedger, Yundi.	91	113	
	92	157	
	93	173	443
	94	154	
	95	142	
	96	168	464
			907

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.	
Langmaid & Bettison, Salisbury.	97	150	
	98	62	
	99	115	327
	100	172	
	101	79	
	102	6	257
			584
E. Portlock, Meadows.	103	202	
	104	177	
	105	182	561
	106	155	
	107	130	
	108	170	455
			1,016
Murray Powell, Jupiter Creek.	109	194	
	110	47	
	111	192	433
	112	166	
	113	191	
	114	39	396
			829
G. W. Bignell, Meadows.	115	185	
	116	151	
	117	154	490
	118	101	
	119	174	
	120	176	451
			941
W. M. Field, Yundi.	121	179	
	122	32	
	123	151	362
	124	107	
	125	66	
	126	163	336
			698
C. R. Wharton, Meadows.	127	177	
	128	188	
	129	205	570
	130	196	
	131	175	
	132	147	518
			1,088
H. H. Hefford, Murray Bridge.	133	163	
	134	180	
	135	181	524
	136	76	
	137	179	
	138	118	373
			897
F. W. Gage, Meadows.	139	163	
	140	5	
	141	dead	168
	142	166	
	143	164	
	144	115	445
			613
W. H. L. Norman, Echunga.	145	77	
	146	64	
	147	—	141
	148	208	
	149	170	
	150	102	480
			621
B. R. Whittington, Yundi.	151	147	
	152	115	
	153	161	423
	154	186	
	155	147	
	156	160	493
			916
B. C. Sanders, Meadows.	157	190	
	158	194	
	159	208	592
	160	180	
	161	122	
	162	dead	302
			894
H. H. Gallagher, Pooraka.	163	90	
	164	-	
	165	176	266
	166	145	
	167	102	
	168	193	440
			706
W. Sickert, Meadows.	169	202	
	170	124	
	171	208	534
	172	152	
	173	141	
	174	157	450
			984
W. Restall, Echunga.	175	108	
	176	—	
	177	148	256
	178	176	
	179	159	
	180	122	457
			713
A. G. Dawes, 230, Portrush Road, Glenunga.	181	198	
	182	158	
	183	168	524
	184	134	
	185	95	
	186	193	422
			946
G. W. Sykes, Yundi	187	170	
	188	95	
	189	111	376
	190	151	
	191	149	
	192	184	487
			863
R. Bartley, Meadows.	193	108	
	194	208	
	195	176	492
	196	128	
	197	162	
	198	171	461
			953
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	104	
	200	162	
	201	101	367
	202	160	
	203	94	
	204	108	362
			729

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.	
J. J. Devlin, Meadows.	205	155	
	206	178	
	207	216	549
	208	177	
	209	159	
	210	209	545
			1,094
D. J. Foxwell, Echunga.	211	113	
	212	164	
	213	47	324
	214	26	
	215	179	
	216	86	291
			615
F. J. Buck, Meadows.	217	151	
	218	185	
	219	188	524
	220	97	
	221	143	
	222	114	354
			878
J. A. Grist, Yundi.	223	70	
	224	122	
	225	154	346
	226	68	
	227	—	
	228	154	222
			568
L. A. King, Meadows.	229	175	
	230	179	
	231	—	354
	232	77	
	233	—	
	234	—	77
			431
R. W. Sando, Echunga.	235	127	
	236	81	
	237	95	303
	238	121	
	239	116	
	240	126	363
			666
R. W. Young, Meadows.	241	177	
	242	134	
	243	170	481
	244	168	
	245	—	
	246	90	258
			739
A. Jarvis, Yundi.	247	177	
	248	102	
	249	152	431
	250	181	
	251	139	
	252	216	536
			967
	253	2	
	254	3	
	255	—	5
	256	2	
	257	3	
	258	2	7
			12
S. Bridge, Yundi.	259	186	
	260	199	
	261	167	552
	262	115	
	263	157	
	264	145	417
			969
H. G. Egarr, Meadows.	265	154	
	266	86	
	267	—	240
	268	22	
	269	129	
	270	41	192
			432
R. H. Smith, Yundi.	271	184	
	272	161	
	273	186	531
	274	197	
	275	50	
	276	186	433
			964
J. M. Lawson, Meadows.	277	194	
	278	198	
	279	145	537
	280	122	
	281	167	
	282	76	365
			902
J. O. Marshall, Yundi.	283	28	
	284	179	
	285	186	393
	286	156	
	287	183	
	288	82	421
			814
G. Joyce, Meadows.	289	14	
	290	210	
	291	85	309
	292	100	
	293	207	
	294	155	462
			771
J. A. Bradtke, Yongala.	295	12	
	296	—	
	297	173	
		185	
W. H. A. Hodgson, Salisbury.	298	168	
	299	191	
	300	194	
		553	
A. W. McDonald, Gawler.	301	61	
	302	162	
	303	177	
		400	
J. H. Dowling, Glossop.	304	156	
	305	148	
	306	22	
		326	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb, 1936.	
A. P. Urlwin, Balaklava.	307	146	
	308	126	
	309	25	
		297	
L. S. Ekers, Mount Compass.	310	167	
	311	61	
	312	170	
		398	
V. E. Williams, Semaphore Park.	313	199	
	314	196	
	315	201	
		596	
F. P. Munzberg, Tanunda.	316	195	
	317	176	
	318	194	
		565	
Total Class 1		41,771	
Class 2—Any Other Light Breed.			
Langmaid & Bettison, Salisbury. (Black Minorcas.)	319	110	
	320	74	
	321	168	
		352	
A. Heaysman, Government Road, Eden Hills. (Cuckoo Leghorns.)	322	178	
	323	208	
	324	139	
		525	
Total Class No. 2.		877	
Class No. 3—Black Orpingtons.			
A. G. Dawes, 230, Portrush Road, Glenunga.	325	56	
	326	31	
	327	174	261
	328	140	
	329	128	
	330	164	432
			693
H. J. Mills, 108, Edward Street, Edwardstown.	331	191	
	332	161	
	333	168	520
	334	157	
	335	193	
	336	—	350
			870.
K. Pennack, Pooraka.	337	157	
	338	130	
	339	84	371
	340	208	
	341	63	
	342	139	410
			781
H. H. Gallagher, Pooraka.	343	150	
	344	130	
	345	137	417
	346	144	
	347	127	
	348	46	317
			734

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.	
B. Cooke, Kanmantoo.	349	40	
	350	59	
	351	44	
		143	
H. H. Hefford, Murray Bridge.	352	149	
	353	116	
	354	72	
		337	
J. H. Dowling, Glossop.	355	133	
	356	48	
	357	146	
		327	
L. S. Ekers, Mount Compass.	358	146	
	359	96	
	360	158	
		400	
A. G. Dawes, 230, Portrush Road, Glenunga.	452	101	
	453	124	
	454	124	349
	455	74	
	456	164	
	457	160	398
			747
A. P. Urlwin, Balaklava.	465	115	
	466	179	
	467	118	
		412	
Total Class No. 3		5,444	
Class No. 4.—Any Other Heavy Breed.			
H. J. Mills, 108, Edward Street, Edwardstown. (Rhode Island Reds.)	361	3	
	362	—	
	363	84	87
	364	210	
	365	99	
	366	—	309
			396
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	367	96	
	368	132	
	369	87	315
	370	160	
	371	91	
	372	147	398
			713
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens. (Rhode Island Reds.)	373	156	
	374	176	
	375	—	332
	376	61	
	377	148	
	378	151	360
			692
V. F. Gameau, Findon Road, Woodville. (Rhode Island Reds.)	379	70	
	380	157	
	381	146	373
	382	117	
	383	25	
	384	79	221
			594

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.	
	385	165	
	386	122	
K. Pennack, Pooraka. (Barnevelders.)	387	129	416
	388	165	
	389	165	
	390	150	480
			896
	458	19	
	459	116	
A. G. Dawes, 230, Portrush Road, Glenunga. (Rhode Island Reds.)	460	133	268
	461	15	
	462	150	
	463	126	291
			559
Total Class No. 4			3,850

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs.	
	391	181	
	392	85	
G. R. Cowell, Balhannah.	393	—	266
	394	94	
	395	62	
	396	130	286
			552
	397	41	
	398	175	
A. J. Monkhouse, Woodside.	399	172	388
	400	103	
	401	169	
	402	168	440
			828
	403	152	
	404	158	
G. R. Cowell, Balhannah.	405	68	378
	406	153	
	407	100	
	408	—	253
			631
Total Class No. 5			2,011

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs.
	409	124
W. R. Christie, Upper Mitcham.	410	129
	411	125
		378
Total Class No. 7		378

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	140
	413	70
	414	128
		338
Total Class No. 8		338

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.
Peter Western, Ascot Park School. (White Leghorn.)	415	203
Peter Western, Ascot Park School. (White Leghorn.)	416	194
William Sando, Echunga School. (White Leghorn.)	417	181
Douglas Marshall, Yundi School (White Leghorn.)	418	177
Norman Page, Murray Bridge School. (White Leghorn.)	419	176
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	132
Dean Colwell, Grange School (White Leghorn.)	421	142
Warren Hannaford, Paracombe School (White Leghorn.)	422	204
W. Horne, Woodville School. (White Leghorn.)	423	—
Owen Robinson, Ascot Park School. (White Leghorn.)	424	160
June Chapman, Woodchester School. (White Leghorn.)	425	161
Rosa Hunt, Morphett Vale School (White Leghorn.)	426	100
Jack O'Sullivan, Morphett Vale School (White Leghorn.)	427	128
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	67
James Taylor, Morphett Vale School. (White Leghorn.)	429	182
William Gregory, Victor Harbour School. (White Leghorn.)	430	154
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	161
Clifford Burford, Smithfield School. (White Leghorn.)	432	116
Tom Callaghan, Smithfield School. (White Leghorn.)	433	49
Eric Pratt, Abattoirs School. (White Leghorn.)	434	214
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	189
Alan Yelland, Cunliffe School. (Minorca.)	436	105
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	194

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 16th Feb., 1936.
Clarence King, Tarlee School. (White Leghorn.)	438	89
Olive Pitman, Gilles Plains School. (Black Orpington.)	439	117
Donald Heading, Sturt School. (Black Orpington.)	440	166
Clive Steer, Sturt School. (Black Orpington.)	441	163
Herbert Oliver, McLaren Vale School. (Black Orpington.)	442	182
Lyol Stone, Morphett Vale School. (Black Orpington.)	443	146
Ray Candy. Noarlunga School. (Black Orpington.)	444	73
Malcolm Booth, Bridgewater School. (Black Orpington.)	445	169
Murray Hencker and Frank Short, Hamley Bridge School. (Black Orpington.)	446	160
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	447	50
Peter Preece, Gilles Plains School. (Rhode Island Red.)	448	69
Cliff Crosser, Wellington Road School. (White Leghorn.)	449	140
John Keldoulis, Orroroo School. (Black Orpington.)	450	171
Bruce Dooland, Thebarton School. (Black Orpington.)	451	150
Alan Yelland, Cunliffe School. (Rhode Island Red.)	464	104
Total		5,338

LEADING SCORES TO WEEK ENDED 16th FEBRUARY, 1936.
FIRST GRADE EGGS ONLY.

SECTION I.—WET MASH.

Class 1.—White Leghorns.

	Eggs Laid.	Bird Nos.
Singles—		
E. McKee	231	27
H. C. Stacy	222	36
A. Jarvis	216	252
J. J. Devlin	216	207
Trios—		
E. McKee	611	28–30
V. E. Williams	596	313–315
B. C. Sanders	592	157–159
Teams—		
J. J. Devlin	1,094	205–210
C. R. Wharton	1,088	127–132
S. Hill	1,072	85–90

Class 2.—Any other Light Breed.

	Eggs Laid.	Bird Nos.
Singles—		
A. Heaysman (Cuckoo Leghorn)	208	323
A. Heaysman (Cuckoo Leghorn)	178	322
Langmaid and Bettison (Black Minorca)	168	321

Class 3.—Black Orpingtons.

	Eggs Laid.	Bird Nos.
Singles—		
K. Pennack	208	340
H. J. Mills	193	335
A. G. Dawes	191	331
Trios—		
H. J. Mills	520	331–333
A. G. Dawes	432	328–330
H. H. Gallagher	417	343–345
Teams—		
H. J. Mills (only 5 birds)	870	331–336
K. Pennack	781	337–342
A. G. Dawes	747	452–457

Class 4.—Any other Heavy Breed.

	Eggs Laid.	Bird Nos.
Singles—		
H. J. Mills (Rhode Island Red)	210	364
F. F. Welford (Rhode Island Red)	176	374

Class 4.—Any other Heavy Breeds—continued.

Trios—	Eggs laid.	Bird Nos.
K. Pennack (Barnevelders)	480	388–390
K. Pennack (Barnevelders)	416	385–387
A. G. Dawes (Rhode Island Reds)	398	370–372
Teams—		
K. Pennack (Barnevelders)	896	385–390
A. G. Dawes (Rhode Island Reds)	713	367–372
F. F. Welford (Rhode Island Reds, only 5 birds)	692	373–378

SECTION II.—DRY MASH.

Class 5.—White Leghorns.

Singles—		
G. R. Cowell	181	391
A. J. Monkhouse	175	398
A. J. Monkhouse	172	399
Trios—		
A. J. Monkhouse	440	400–402
A. J. Monkhouse	388	397–399
Teams—		
A. J. Monkhouse	828	397–402
G. R. Cowell (only 5 birds)	631	403–408

Class 7.—Black Orpingtons.

Singles—		
W. R. Christie	129	410

Class 8.—Any other Heavy Breed.

W. R. Christie (Rhode Island Red)	140	412

SECTION III.—WET MASH.

Eric Pratt, Abattoirs (White Leghorn)	214	434
Warren Hannaford, Paracombe (White Leghorn)	204	422
Peter Western, Ascot Park (White Leghorn)	203	415
Peter Western, Ascot Park (White Leghorn)	194	416
Gordon Gallasch, Gilles Plains (White Leghorn)	194	437
Stanley Pratt, Abattoirs (White Leghorn)	189	435

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April, 1935, to 29th February, 1936.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal: 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 31st January, 1936.	No. Eggs Laid Month of February, 1936.	Total Eggs Laid 1st April, 1935, to 29th February, 1936.
No. 1 Test	6,183	694	6,877
No. 2 Test	6,447	575	7,022
No. 3 Test	6,727	712	7,439
No. 4 Test	5,463	640	6,103
No. 5 Test	5,599	560	6,159

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO. LIMITED reported on 2nd March, 1936.

BUTTER.—Since our last report production has shown a seasonal decline each week. This has been more pronounced in the quantity of top grade butter which is now short of local needs, although there is a surplus of lower grades which is being packed each week for London. The London butter market during the last week or two has weakened and prices came back. However, under the equalization plan it has not been necessary to alter local prices, which at present are ruling at:—Choicest creamery fresh butter, in bulk, 1s. 3¾d. per lb. Prints and delivery extra (this price is for local sale only, and under the quota system, the equalized price manufacturers will receive will be 1s. $^{15}/_{16}$d. per lb., on which basis payments to cream suppliers will be calculated); separator lines, from 11½d. to 1s. per lb. for choicest; stores, 7d. to 8½d. per lb. (these prices are subject to equalization levies).

CHEESE.—As with other produce this commodity is now being manufactured in lessened quantities, but the tonnage this season has easily constituted a record. Shipments have gone forward regularly to Britain, but within the next week or two all that is manufactured will be required for the trade within the Commonwealth. Local prices are steady at:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. 1d. to 1s. 1½d. per lb.

EGGS.—The supplies reaching the packing floors have kept up fairly well for this time of the year, but owing to the warm weather the quality of many country lots has been poor. As soon as the cooler weather sets in no doubt an improvement will result and prices advance. In the meantime values are:—Ordinary country eggs, fair average quality, from 5d. per dozen net; long distance rail or shipping eggs, lower; selected new laid clean eggs, full-sized, 9½d. to 10d. per dozen net.

BACON.—A steady trade in bacon was recorded throughout February, and sales of hams and bacon factory small goods were well maintained. Present prices are:—Best quality sides, 9d. to 9½d. per lb.; middles, 9½d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 1s. 0½d. to 1s. 1d.; cooked, 1s. 3d. to 1s. 3½d. per lb.; lard, bulk, 5½d. to 6d., prints, 6½d. to 7d. per lb.

ALMONDS.—Consignments of the new crop are now coming to hand, and where the almonds are nicely dried out ready sales are being effected at quotations:—Softshells and Brandis, 8½d. to 9d.; hardshells, 5d. to 5½d.; kernels, 1s. 9½d. to 1s. 10½d. per lb.

HONEY.—There is no improvement to report in the trade of this commodity, demand still being dull. Heavy stocks are held by wholesalers in the city and quotations have not altered, being:—Prime quality clear extracted, 2d. to 2½d.; lower grades, 1d. to 2d. per lb.

BEESWAX.—Rather heavier supplies have been marketed during recent weeks and trade was quiet at:—1s. 2½d. to 1s. 3½d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms which are in every way the best equipped in the State. The demand for all classes of birds in our markets has been well maintained, and except for slight fluctuations values continue fairly steady. No doubt prices for good quality birds will improve with the nearer approach of Easter. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. 6d. to 4s. 6d.; nice-conditioned cockerels, 2s. 10d. to 3s. 5d.; fair-conditioned cockerels, 2s. to 2s. 8d.; chickens, lower; heavyweight hens, 2s. 2d. to 3s.; medium hens, 1s. 8d. to 2s. 1d.; light hens, 1s. to 1s. 6d.; couple of pens of weedy sorts, lower; prime young Muscovy drakes, 3s. 2d. to 4s.; young Muscovy ducks, 1s. 10d. to 2s. 5d.; ordinary ducks, 1s. to 1s. 9d.; ducklings, lower; geese, 2s. to 3s. 6d.; goslings, lower; turkeys, good to prime condition, 9d. to 1s. 1d. per lb. live weight; turkeys, fair condition, 7d. to 8d. per lb. live weight; turkeys, poor and crooked-breasted, lower; pigeons, 3d. to 3½d. each.

POTATOES.—New season's, 7s. 6d. per cwt.

ONIONS.—New season's, 9s. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of February, 1936, and also the average precipitation for February, and the average annual rainfall.

Station.	Feb. 1936.	Av'ge. for Feb.	To end Feb. 1936.	Av'ge. Annual Rain-fall.
Far North and Upper North.				
Oodnadatta ..	0·35	0·56	0·93	4·62
Marree	0·05	0·50	0·69	5·83
Farina	0·30	0·53	0·73	6·37
Copley	0·20	0·52	1·20	7·85
Beltana.......	0·40	0·68	1·91	8·47
Blinman	0·48	0·74	1·71	11·81
Hookina	0·60	0·46	2·80	11·18
Hawker	0·82	0·58	1·78	12·2
Wilson	1·14	0·63	3·25	11·77
Gordon	0·80	0·78	1·66	10·46
Quorn	1·21	0·60	1·85	13·15
Port Augusta..	0·73	0·52	2·89	9·40
Bruce	0·98	0·58	4·81	9·74
Hammond	0·73	0·60	2·66	11·11
Wilmington ..	1·01	0·61	3·17	17·28
Willowie	1·50	0·71	2·56	12·22
Melrose	1·20	0·86	3·01	22·85
Booleroo Centre	0·99	0·66	2·05	15·21
Port Germein .	0·64	0·52	2·11	12·53
Wirrabara	0·67	0·68	1·26	19·25
Appila........	1·01	0·67	2·25	14·62
Cradock	0·87	0·66	1·71	10·78
Carrieton	0·74	0·58	2·29	12·19
Johnburg	0·77	0·54	2·58	10·56
Eurelia	0·78	0·62	2·74	12·76
Orroroo.......	0·78	0·63	2·11	13·20
Nackara	0·40	0·68	8·21	11·09
Black Rock ...	1·10	0·63	2·86	12·35
Oodlawirra ...	1·03	0·63	3·06	11·67
Peterborough..	1·17	0·60	3·10	13·22
Yongala	0·82	0·67	3·78	14·43
North-East.				
Yunta	0·21	0·62	1·79	8·84
Waukaringa ..	0·15	0·52	2·03	7·89
Mannahill	0·30	0·69	1·08	8·16
Cockburn	0·01	0·60	2·11	7·91
Broken Hill ..	0·14	0·84	1·99	9·50
Lower North.				
Port Pirie	0·43	0·53	4·17	13·19
Port Broughton	0·44	0·54	1·56	13·85
Bute	1·18	0·52	3·16	15·39
Laura	1·02	0·69	3·64	17·97
Caltowie	1·18	0·69	2·40	16·76
Jamestown....	1·04	0·66	2·69	17·72
Gladstone	0·93	0·61	2·06	16·32
Crystal Brook .	0·49	0·63	2·95	15·76
Georgetown ..	0·76	0·72	2·16	18·29
Narridy	0·73	0·62	1·49	15·77
Redhill	0·54	0·63	4·15	16·54
Spalding	1·31	0·79	2·25	18·74
Gulnare	0·64	0·80	1·61	18·59
Yacka	0·81	0·64	1·65	15·38
Koolunga	0·61	0·65	1·59	15·32
Snowtown	0·71	0·54	3·80	15·70
Lower North—*continued.*				
Brinkworth	0·65	0·68	1·26	15·73
Blyth	0·41	0·64	2·13	16·73
Clare	1·06	0·82	3·48	24·45
Mintaro	0·91	0·74	2·40	23·36
Watervale	0·78	0·79	3·27	26·74
Auburn	0·73	0·83	3·74	23·96
Hoyleton	0·47	0·56	2·52	17·27
Balaklava.......	0·66	0·56	1·41	15·43
Port Wakefield ..	1·10	0·63	2·77	12·93
Terowie	0·87	0·81	5·07	13·34
Whyte-Yarcowie	0·73	0·72	5·58	13·58
Hallett	0·98	0·71	2·57	16·41
Mount Bryan....	1·95	0·79	3·31	16·77
Kooringa	0·81	0·69	2·93	17·81
Farrell's Flat ...	1·33	0·65	4·29	18·54
West of Murray Range.				
Manoora	0·98	0·62	2·29	18·94
Saddleworth	0·64	0·71	2·61	19·59
Marrabel........	0·85	0·62	2·09	19·96
Riverton........	1·29	0·67	2·79	20·79
Tarlee	1·18	0·63	2·47	18·09
Stockport	0·99	0·60	2·76	16·97
Hamley Bridge .	0·64	0·64	2·65	16·52
Kapunda	1·28	0·69	3·12	19·76
Freeling	0·86	0·61	2·04	17·79
Greenock	1·17	0·69	2·44	21·47
Truro	0·98	0·67	3·11	19·79
Stockwell	1·35	0·71	3·03	20·04
Nuriootpa	1·41	0·66	2·91	20·68
Angaston	1·47	0·70	3·69	22·32
Tanunda........	1·17	0·65	2·43	21·94
Lyndoch	0·70	0·68	1·51	23·27
Williamstown ...	0·87	0·70	1·33	27·61
Adelaide Plains.				
Owen	0·68	0·78	2·18	14·64
Mallala	0·94	0·61	2·04	16·49
Roseworthy	0·66	0·57	1·52	17·42
Gawler	0·51	0·68	2·20	18·85
Two Wells	0·79	0·56	1·70	15·76
Virginia	0·55	0·59	2·30	17·20
Smithfield	1·07	0·71	1·52	17·65
Salisbury	0·56	0·63	0·96	18·56
Adelaide	0·66	0·81	2·11	21·14
Glen Osmond....	0·73	0·70	2·30	25·97
Magill	0·75	0·80	1·77	25·37
Mount Lofty Ranges.				
Teatree Gully ...	0·90	0·86	1·64	27·07
Stirling West ...	1·18	1·20	2·31	46·95
Uraidla	0·89	1·09	1·94	43·95
Clarendon.......	0·82	0·87	1·48	32·79
Happy Val'y Res.	0·77	—	1·63	—
Morphett Vale ..	0·50	0·73	1·10	22·59
Noarlunga	0·65	0·69	1·43	20·33
Willunga	0·53	0·80	1·36	25·97
Aldinga.........	0·57	0·69	1·05	20·21

RAINFALL—*continued.*

Station.	Feb 1936.	Av'ge. for Feb.	To end Feb. 1936.	Av'ge. Annual Rainfall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	0·48	1·13	1·20	29·42
Inman Valley	0·60	—	1·77	—
Yankalilla	0·59	0·78	1·34	22·76
Mount Compass	0·90	—	2·08	—
Mount Pleasant	1·17	0·76	3·73	27·11
Birdwood	1·07	0·71	2·14	29·07
Gumeracha	0·83	0·82	1·47	33·31
Millbrook Res.	0·87	1·08	1·48	34·47
Lobethal	1·22	0·88	2·16	35·91
Woodside	0·79	0·89	2·20	32·15
Hahndorf	0·53	0·87	1·35	34·77
Nairne	0·86	0·90	2·72	28·12
Mount Barker	0·53	0·91	2·22	31·24
Echunga	0·80	0·91	2·68	33·25
Macclesfield	0·62	0·89	3·69	30·34
Meadows	0·93	0·97	3·03	36·02
Strathalbyn	1·13	0·72	2·93	19·32
MURRAY FLATS AND VALLEY				
Meningie	0·24	0·61	1·44	18·31
Milang	0·69	0·57	1·67	14·89
Langhorne's Ck	0·68	0·61	2·01	14·91
Wellington	0·63	0·59	2·10	14·65
Tailem Bend	1·02	0·78	3·78	15·06
Murray Bridge	1·18	0·58	2·81	13·51
Callington	0·60	0·56	2·05	15·15
Mannum	0·88	0·49	2·19	11·48
Palmer	1·12	0·66	3·15	15·59
Sedan	0·75	0·54	2·24	12·05
Swan Reach	0·53	0·71	2·90	10·65
Blanchetown	0·34	0·57	3·72	11·01
Eudunda	1·27	0·65	3·97	17·15
Point Pass	1·34	0·56	3·72	16·72
Sutherlands	0·40	0·52	3·22	10·81
Morgan	0·46	0·56	2·30	9·16
Waikerie	0·60	0·97	4·46	9·66
Overland Corner	0·31	0·65	3·96	10·25
Loxton	0·30	0·95	3·13	11·50
Berri	0·42	0·89	3·72	10·13
Renmark	0·52	0·75	4·56	10·38
WEST OF SPENCER'S GULF.				
Eucla	0·51	0·67	0·67	10·02
Nullarbor	0·15	0·48	0·66	8·85
Fowler's Bay	0·14	0·49	0·22	11·91
Penong	0·22	0·72	0·49	12·22
Koonibba	0·39	0·85	0·66	12·09
Denial Bay	0·67	0·65	0·79	11·19
Ceduna	0·60	0·58	0·79	10·21
Smoky Bay	0·39	0·52	0·39	10·42
Wirrulla	0·90	0·42	0·90	10·51
Streaky Bay	0·17	0·49	0·18	14·85
Chandada	0·34	0·39	0·34	12·42
Minnipa	0·55	0·81	0·66	13·91
Kyancutta	0·61	0·78	1·25	12·77
Talia	0·14	0·43	0·14	14·76
Port Elliston	0·09	0·45	0·16	16·51
Lock	0·53	0·78	2·08	16·34
Mount Hope	0·09	—	0·09	—
Yeelanna	0·21	0·52	0·23	15·94
Cummins	0·22	0·60	0·36	17·58
Port Lincoln	0·57	0·61	1·01	19·37
Tumby	0·48	0·55	0·74	14·25
Ungarra	1·90	0·69	2·30	16·87
Port Neil	1·50	0·73	1·72	13·11

Station.	Feb. 1936.	Av'ge. for Feb.	To end Feb. 1936.	Av'ge. Annual Rainfall.
WEST OF SPENCERS GULF—*continued.*				
Arno Bay	0·69	0·68	1·42	12·71
Rudall	0·92	0·75	2·16	12·98
Cleve	0·44	0·68	2·92	14·88
Cowell	0·97	0·62	2·37	11·07
Miltalie	0·58	0·67	2·51	13·70
Mangalo	0·18	0·82	5·82	13·86
Darke's Peak	0·50	0·81	2·52	15·08
Kimba	0·35	0·92	1·08	11·68
YORKE PENINSULA.				
Wallaroo	1·10	0·52	2·54	13·97
Kadina	1·51	0·51	2·89	15·60
Moonta	0·62	0·53	1·89	15·06
Paskeville	0·91	0·48	6·18	15·47
Maitland	0·61	0·64	1·34	19·85
Ardrossan	1·17	0·47	1·74	13·95
Port Victoria	0·67	0·51	0·81	15·41
Curramulka	0·88	0·51	1·04	17·81
Minlaton	0·81	0·50	0·97	17·74
Port Vincent	0·75	0·60	1·17	14·38
Brentwood	0·52	0·55	0·61	15·54
Stansbury	0·92	0·50	1·33	16·81
Warooka	0·43	0·54	0·64	17·44
Yorketown	0·56	0·50	0·83	16·83
Edithburgh	0·63	0·54	0·87	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	0·20	0·64	1·29	24·80
Kingscote	0·06	0·60	0·91	19·16
Penneshaw	0·11	0·79	0·59	19·00
Victor Harbour	0·55	0·73	2·05	21·40
Port Elliot	0·61	0·72	2·07	19·94
Goolwa	0·53	0·69	2·56	17·86
Maggea	0·57	0·63	4·53	10·20
Copeville	0·73	0·76	4·90	11·53
Claypans	0·62	0·68	3·51	10·42
Meribah	0·46	0·70	3·46	11·32
Alawoona	0·46	0·66	3·86	10·40
Caliph	0·45	0·48	3·13	10·98
Mindarie	0·40	0·66	3·12	12·23
Sandalwood	0·62	0·71	4·46	13·64
Karoonda	0·45	0·82	3·35	14·17
Pinnaroo	0·26	0·97	3·45	14·36
Parilla	0·34	0·74	3·19	13·72
Lameroo	0·34	0·80	3·01	15·87
Parrakie	0·40	0·75	2·84	14·56
Geranium	0·35	0·74	3·06	16·36
Peake	0·37	0·88	2·06	15·93
Cooke's Plains	0·75	0·64	4·15	15·28
Coomandook	0·42	0·67	2·74	17·03
Coonalpyn	0·24	0·64	2·00	17·61
Tintinara	0·24	0·83	1·71	18·62
Keith	0·16	0·95	1·76	17·93
Bordertown	0·18	0·79	1·61	19·14
Wolseley	0·11	0·77	1·52	18·47
Frances	0·10	0·79	1·53	20·08
Naracoorte	0·03	0·75	1·24	22·63
Penola	0·01	0·85	0·78	25·96
Lucindale	0·04	0·69	1·93	23·38
Kingston	0·02	0·70	1·66	24·24
Robe	0·07	0·75	1·41	24·64
Beachport	0·10	0·91	1·48	27·06
Millicent	0·07	1·03	2·22	29·83
Kalangadoo	0·07	1·46	1·15	32·20
Mount Gambier	0·12	1·06	1·14	30·37

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		April	May
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	1097	3	1
Alma	1098	—	—
Angaston	*	—	—
Appila-Yarrowie	1097	3	1
Arthurton	*	—	—
Ashbourne	*	1	6
Auburn Women's	1104	24	29
Balaklava	*	27	25
Balhannah	*	—	—
Balhannah Women's	1104	—	—
Balumbah	1098	—	—
Balumbah Women's	*	1	6
Barmera	*	—	—
Barroota	*	13	11
Beetaloo Valley	1097	6	4
Beetaloo Valley Women's	*	—	—
Belalie Women's	*	14	12
Belvidere	*	—	—
Berri	*	6	4
Blackheath	1098	9	7
Black Rock	*	—	—
Black Springs	1098	—	—
Blackwood	*	13	11
Block E	*	—	—
Blyth	*	24	22
Booborowie	1097	6	4
Booleroo Centre	*	24	22
Boolgun	*	—	—
Boor's Plains	1098	—	7
Boor's Plains Women's	1104	—	7
Brentwood	*	6	4
Brimpton Lake	*	—	—
Brinkley	*	1	6
Brownlow	*	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	1098	16	21
Butler	*	—	—
Calca	*	—	—
Caliph	*	7	5
Carey's Gully	*	—	—
Chandada	*	—	—
Chapman's Bore	1098	6	4
Cherry Gardens	1098	4	2 & 30
Chilpuddie Rock	*	—	—
Clare Women's	1104	4	2
Clarendon	*	28	24
Collie	*	1	6
Coomandook	*	24	29
Coonalpyn	1098	—	6
Coonalpyn Women's	*	1	6
Coonawarra	*	9	7
Coonawarra Women's	1104	16	21
Cummins	*	10	8
Cungena	*	2	7
Currency Creek	*	6	4
Devlin's Pound	1098	—	—
Devlin's Pound Women's	*	8	6
Dudley	1098	—	—
Echunga	*	8	13
Echunga Women's	1104	1	6
Eurelia	*	11	9
Eurelia Women's	*	1	6
Finniss	*	—	—
Frayville	*	—	—
Gawler River	*	—	—
Georgetown Women's	*	14	12
Gladstone	1097	3	1
Gladstone Women's	1104	21	19
Goode	*	—	—
Goode Women's	*	—	—
Green Patch	1098	2	7
Greenock	1098	20	18
Gumeracha	*	6	4
Hanson	1098	7	5
Hartley	1098	1	6
Hilltown	*	7	5
Hindmarsh Island	*	—	—
Hope Forest	1098	6	4
Hope Forest Women's	1104	—	—
Inman Valley	*	16	21
Iron Bank	*	8	6
Jamestown	1097	15	20
Jervois	*	9	14
Kalangadoo	*	11	9
Kalangadoo Women's	*	11	9
Kangarilla Women's	*	16	21
Kanni	*	—	—
Karte	*	—	—
Karte Women's	1104	—	6
Kelly	1098	4	2
Ki Ki	*	—	—
Kilkerran	1098	2	4
Koolunga	*	—	—
Koonunga	1098	—	—
Koppio	*	8	6
Kulkawirra	*	14	12
Kyancutta	*	7	5
Kybybolite	*	2	7
Kybybolite Women's	1104	8	5
Lameroo	*	4	2
Laura	*	4	27
Laura Bay	1098	14	12
Laura Bay Women's	*	11	16
Lenswood and Forest Range	*	—	—
Light's Pass	1098	—	4
Lipson	1098	4	2
Lobethal	1098	16	21
Lobethal Women's	*	20	18
Lone Gum and Monash	*	16	21
Lone Pine	*	6	4
Longwood	*	—	—
Lyndoch	1098	7	5
MacGillivray	*	7	5
McLaren Flat	1098	—	—
McLaren Flat Women's	1104	2	7
Maltee	1098	2	7
Maltee Women's	1104	—	—
Mangalo	*	—	—
Mangalo Women's	*	8	13
Marama	*	—	—
Milang	*	—	2
Millicent	*	25	22
Millicent Women's	*	—	—
Miltalie	*	4	2
Minnipa	*	—	—
Monarto South	1098	—	—
Monarto South Women's	1104	18	16
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Moorook	*	—	—
Morchard	*	3	1
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Mount Bryan	*	—	—
Mount Compass	*	—	—
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Murraytown	*	—	—
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Narrung	*	—	—
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Parrakie	*	—	—
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* No report received during the month of February. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from August 1st, 1934, with the following exceptions:—Life Members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

LIFE MEMBERS.

At the February meeting of the Advisory Board of Agriculture the names of Messrs. F. H. Wolf and G. C. Heinjus (Rosedale) and H. A. Eckert (jun.), of Belvidere, were added to the roll of Life Members of the Agricultural Bureau of South Australia.

MACHINERY.

POWER FARMING.

The Booleroo Centre Branch has recently been re-organised after having been in recess. At the September meeting nine members were present and the following paper was presented by Mr. J. Heddle:—Probably no question in connection with cereal growing has aroused more controversy in recent years than power farming. Before embarking on a power farming scheme the farmer must ask himself the following questions—(1) "Am I prepared to pay careful attention to the tractor to ensure successful working, with a minimum of expenditure for upkeep?" The type of farmer who is satisfied to work sore-shouldered, tender-footed, underfed horses, or one who thinks that a wire twitch does as well in a machine as a bolt, will never be a successful power farmer, for while a team of horses will keep on working under neglected conditions, a tractor certainly will not. Thoroughness and cleanliness are absolutely essential. (2) "Is my financial position such as to warrant the outlay?" (3) "Is my land suitable for power farming?"

In districts where the regular growing of hay presents no difficulty and early paddock feed is a regular feature, the change over is not likely to be so successful as in the purely wheat districts. In the first mentioned districts, many farmers consider that the feed consumed by horses could be more profitably used in the production of fat lambs and wool. (4) "Is the type of tractor I am considering purchasing suitable to the type of farm on which it is intended to work? The farmer having answered these questions in the affirmative one can consider the advantages and disadvantages of the change over.

ADVANTAGES.

The ability to carry a greater number of sheep than where horses are kept:—When power farming first came into vogue, many farmers went on to the two-year system—wheat-fallow—but in later years a better rotation, generally speaking, has been practised. Speaking of my own case and observations generally, the number of sheep carried has been practically doubled, and as the money thus earned is the easiest obtained on a farm, this is no small advantage.

Ability to do the work on hand in a shorter time:—The sowing of wheat at the right time leads to an increased yield, but as has been proved many times, no one knows at seeding which crop will be the most profitable, although it is definite that in 9 years out of 10 wheat sown after the opening rain of the season is a more profitable crop than the one sown dry. It is also known that more ground can be fallowed, harrowed, and cultivated while in a moist condition than with a horse team, and as this helps to conserve moisture, it is a real advantage. The same applies in the case that more wheat can be put into the bags in a day with power farming.

The need to employ less labour:—Through the ability to do his paddock work more quickly, the power farmer is able to devote more time to other farm activities such as attention to stock, control of noxious weeds, repairs to and erection of fences, all of which mean a saving.

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1936.

Eggs for Hatching and Day Old Chickens

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EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30s. per 100.

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EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30s. per 100.

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Free on Rail, Salisbury.

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Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2oz., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

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"First Aid to the Horse" by F. E. Place, B.V.Sc., M.R.C.V.S. Price 3s., Posted, 3s. 2d.

"Journal of the Department of Agriculture"—Subscription 5s. per annum to addresses in South Australia. elsewhere 10s. per annum. Members of the Agricultural Bureau of S.A., 2s. per annum.

Single Copies, 1s. each.

The extra amount of leisure enjoyed through not having to feed and care for horses when not working:—Horses have to be fed and watered regularly for at least eight months of the year and the careful farmer makes a point of regular inspection for the rest of the period. This spare time can be devoted to relaxation, which helps to make farm life less tiresome.

ARGUMENTS AGAINST POWER FARMING.

That the feed used for horses is grown on the farm and that fuel for tractors has to be purchased:—This is the case, but it must be remembered that the average cut for hay has a definite cash value. For instance, if 30 acres of a crop averaging seven bags with wheat at 3s. a bush. is cut for hay, it represents an outlay of £94 10s. less harvesting expenses. These figures are used merely for the purposes of explanation. On occasions, such as when a crop has been frosted so as to be valueless for wheat, it is a real asset for hay, and on the other hand a short wheat crop makes expensive hay. With horses, the value of the hay is taken out before using, while with a tractor the wheat can be sold, the money banked, and the fuel expenses spread over the whole year.

That the introduction of hay and consequently less hay being cut and more wheat placed on the market has provided the surplus which has been causing low wheat values: —Undoubtedly a certain amount of extra wheat has been placed on the market, but not enough to make any difference. The fact is the world is going through one of the periods when the value of all primary products is at a low ebb. These low periods have always occurred. In 1891-1896, before tractors were thought of, wheat was of less value than it is to-day.

That with horses breeding operations are carried out and the team kept up to strength with young horses:—This actually happens only on an occasional farm. It is a rare thing to find a farmer able to rear sufficient horses for his needs. It is no unusual thing to be shown a foal which has cost its owner from £10 to £15 in stud fees. It is quite the usual thing to be told that the high prices for horses are due to farmers going back to horses, but careful observation reveals that not 1 per cent. of horses sold are purchased for that reason. They are purchased by farmers who neglect to breed enough for their use or who tried and were not successful in doing so.

That the introduction of tractors leads to unemployment for farm labourers:—This is so to a certain extent, but so has every other kind of farm implement; the multi-purpose plough, binders instead of mowers, harvesters instead of strippers and winnowers, combines instead of drills, &c., have contributed, so that the whole fault cannot be laid on the tractor. It is said that the tractors have ruined blacksmiths and saddlers. The only difference to the blacksmith has been the loss of shoeing, a fact which few smiths regret. Saddlers have certainly lost trade, but the keepers of petrol and oil depots have gained, and when one takes into consideration the increased amount of freight on the railways, which needs extra men to handle, mechanics, &c., it is very doubtful if any unemployment is caused.

The tractor has proved of great advantage in certain portions of newly taken up country, particularly for scrub rolling. In opening up new country it saves the cost of stables and water provision—a big item. The use of the tractor is looked on askance by many farmers, but it is really only another step in the mechanisation of farming. Sinister fears were expressed by farmers where super, drills, harvesters, dry pickling and other new and improved methods came into being; in fact, the introduction of mechanical power into any industry at first aroused suspicion right from the time of the introduction of machinery into the Lancashire mills. Mechanical power has been the means of reducing the costs of production in every industry, and with the advent of Diesel engines, which are reaching a high state of efficiency, it seems certain to do as much for the wheatgrower.

After an exhaustive inquiry the Wheat Commission in a statement on the costs between horses and tractors gave them as equal This appears to make power farming more profitable when wool and labour are considered.

A detailed comparison of costs of tractors and horses has not been made in this paper. In nothing is the old saying, "One's man meat is another man's poison" more clearly proved than in power farming. Conditions and costs of both horses and tractors differ so much that comparison needs to be spread over a period of years. In any case, the final result is the true statement of costs. One man's expenses may be £50 less than another, yet the man with the bigger costs may produce more than that amount extra. Two adjoining farms each using horses may have a difference of 25 per cent. to 30 per cent. in their total products value for the year, so with tractors, the success or failure is largely a matter of the individual. After eight years of power farming, I am convinced that to me it has been a profitable investment, and that the golden rule for power farmers is care. (Secretary, J. McCarthy.)

CARE OF FARM MACHINERY.

At a meeting of the Baroota Branch held on 9th December, Mr. W. A. McDougall read a paper on the above subject. In building a shed for the protection of farm implements he preferred a double lean-to type with the opening towards the south. Sliding doors were satisfactory while new, but after a time they might give a good deal of trouble. Instead of fitting doors, the shed could be built several yards wider than the machinery that it was to contain. No more iron would be used than would be needed for doors, and it meant less expense and trouble. Woodwork on farm machinery should be painted regularly. A good cheap paint could be made up by mixing red lead and boiled oil with a small quantity of turpentine and carriage varnish. A colour to match the red paint could be obtained by mixing yellow ochre, boiled oil, a small amount of white lead, turpentine, and carriage varnish The paint might appear dull, but it could be brightened and altered to different shades by adding colour concentrates, a small tin of which could be bought for a few shillings. It was a good practice to soak all wooden wheels every year or so in hot boiled oil. Care should be taken not to heat the oil too much or it might be spoiled. The best method was to make a special pan of galvanized iron. The pan was placed beneath the jacked-up wheel and the heated oil poured into it. A few hot coals placed beneath the pan would keep the oil hot. The wheel was then slowly turned in the hot bath of oil. A brush shold be used to spread the oil on to the nave and spokes. If done regularly the oiling would add years to the life of the wheels and save much expense in repairs.

On sandy properties tillage implement axles would last much longer if sand guards were fitted. Pieces of old binder canvas were suitable for the purpose. It was advisable to leave an opening in the bottom of the sand guard instead of wrapping the canvas right around the inside of the wheel hub.

WORN BEARINGS.

The most economical treatment for worn bearings was by the use of Magnolia metal or white-metal, which could be used by the average farmer. To repair a worn bearing with Magnolia metal several small holes should be bored through the casting on the side of the worn bearing, in order to hold the metal in its place. The next operation was to take a piece of shaft of the same size as the original, paint it with stove polish, warm both shaft and bearing, and place the shaft inside the bearing. While this was being done some metal should be melted in a ladle. A piece of dough should be made from flour and water and placed around the shaft at each end of the bearing, also over the holes in the casting, leaving one open, through which to pour the metal. It was sometimes advisable to tie a piece of cloth over the dough in order to prevent the hot metal from leaking through. After the metal was poured, the shaft should be removed from the bearing as soon as the metal was set and before it cooled. Worn shafts could be repaired in the same manner, except that the holes should be bored in the shaft instead of in the bearing, and the stove polish painted on the bearing instead of on the shaft. Where Sundercut disc bearing were not too much worn they could be repaired by running metal into the top part of the back half of the bearing. Holes should be bored in the bearing in order to keep the metal in place. Where bearings were too hard to bore, it was necessary to tin them before pouring the metal. Before tinning, the inside of the bearing had to be thoroughly cleaned and a thin layer of solder placed on the worn part with a soldering iron. When ready for pouring the metal, the bearing was heated from outside with a blow lamp until the solder commenced to melt, when the metal was poured in. (Secretary, E. W. Hulster.)

WHAT THE FARMER SHOULD PRODUCE FOR HIS TABLE.

Paper read by Mr. A. B. Brook at a meeting of the Hartley Branch, held on 4th December:—

In this district, most farms are comparatively small, and therefore mixed farming is carried on, thus enabling the farmer to produce on his own farm a large percentage of foodstuffs for his table. Most people like porridge for breakfast, and a very healthful and palatable porridge can be made out of wheat. Most farmers have a crusher or grinder for crushing cereals for stock food, and this machine is quite suitable for crushing wheat for home use. When the wheat is crushed a sieve is required with which to sift the bran from the rest of the crushed wheat, and the porridge meal is then ready for cooking.

The next course at breakfast is bacon and eggs. It is quite possible for the farmer to produce both of these articles for his table. It does not require many head of poultry of a good laying strain to produce enough eggs to supply the household all the year round. During laying season, eggs can be pickled for use during the moulting season. Most farmers keep a few pigs for fattening purposes and occasionally one of these could be slaughtered for home use. Winter is the best time for this, as the meat keeps better than in summer, but properly cured bacon will keep for a good length of time. If one carcass is too much for one family, make arrangements with a neighbour to share the meat and the expenses. However, the best plan is to kill a fairly small pig—about 120lbs. dressed weight—and this is not too much for the average family on a farm, including the working hands.

Other meats obtainable on the farm are beef, mutton, and poultry. Beef can only be killed in winter, as there is too much of it to keep well in the hot weather, but mutton can be killed at practically any time, as there is not very much of it—between 60lbs. and 80lbs. generally. When slaughtering beef, the best meat is obtained from a steer about 18 months or 2 years old, which has been fattened and is well grown.

A farmer can supply the home with vegetables and fruit from his land. Fence off a piece of land fairly close to the homestead so that the cook can obtain fresh fruit and vegetables whenever desired. It is not a large garden that is required for home use, but a large variety. Plant two or three almond trees of a good type and two or three apples of varieties which ripen at different times, providing cooking and drying varieties as well as eating; also other varieties of fruit trees and vines. The vegetable garden will prove more profitable than having the greengrocer call at the door, because vegetables do not take up very much of the farmer's time, and the plot can be dressed with stable manure, which is always obtainable on a farm. With the aid of water in summer, vegetables can be grown all the year round and thus ensure a supply of fresh vegetables for the farmer's table. In winter the ground should be well manured and planted with a patch of about 3 or 4 dozen cauliflower and cabbage plants, and small beds each of turnips, beetroot, &c. Do not plant so as to have them all ripening and ready for use at once. By the time the spring crops are nearly finished, prepare the ground for planting tomatoes, cucumbers, and beans. Do not plant too many of these, as they require plenty of water. Potatoes, melons, &c., can be grown in most parts of this district with fairly good results. If farmers produced as much as they possibly could for household consumption, they would be able to live more cheaply. (Secretary, W. J. Brook.)

Annual Field Day of the Blackwood Agricultural Bureau at the Blackwood Experimental Orchard, 7th February, 1936.

TRACTOR *V.* HORSES.

At a meeting of the Nantawarra Branch, on 6th February, Mr. Arthur Bryant read the following paper:—

The fact that the farmer grows his own hay and thereby produces his own fuel for power is by no means a positive proof that he is effecting a saving against buying fuel from overseas for his tractor. Farmers once sowed crops with their own hands and gathered the crops with the help of their wives and families and beat the grain out with a flail.

The material for the post and rail fence was cut by their own hand out of their own scrub. The home was built by his own hands from "wattle and dab," all of which material came off the farm.

Progress saw the imported drill and superphosphate supersede hand sowing; the imported mower, binder, reaper, winnower, harvester, &c., supersede the whole family reaping with a sickle and beating the grain out with a flail. The imported wire and iron fence replaced the post and rail fence. With these changes farmers experienced prosperity and living conditions that our forefathers could never dream of. The hundreds of thousands of tractors now on the farms of the world and the liquid fuel for same is only a continuation of progress. Competition of wheatgrowers throughout the world will force farmers to adopt tractors, because they cheapen the cost of production of wheat.

Opponents to tractors often argue that growing hay for feed (which is only fuel for power) on the farm is to retain and preserve a market. On careful investigation we find that the motor car has practically closed out the buying public, for they do not keep horses excepting in rare instances, and in the years of plenty the price of hay is far below the cost of production.

High prices for hay are not due to the spirited bidding from the public, but are due entirely to shortage of hay on your own farm and other farmers in the same plight bidding against you for the small surplus of hay your neighbour is holding on to. Your fortunate neighbour is extracting from you the highest price he thinks he can get. A team of horses entails more labour, anxiety, and expense than anything else on the farm.

The simplest and most correct way to ascertain the cost of producing a ton of hay is to assume you will cut all your crop for hay. Before one can intelligently compare tractors *versus* horses, the price of producing hay on your farm must be established, as there is a cost attached to producing hay, and to try and ignore this cost is like trying to ignore the fact that the sun rises in the east and sets in the west.

Below is the cost of farming a 600-acre farm in this district, and the average yield per acre is 1¼ tons of hay, which would be the average over a period of good years and lean years. The cost of hay grown as fuel for power is not governed by the fluctuating price list, but is in accordance with the cost of farming a number of acres.

COST OF FARMING 600 ACRES.

	£	s.	d.
Interest on 600 acres at £5 an acre—£3,000 at 5 per cent.	150	0	0
12 horses each consuming 6 tons hay at £2 ton	150	0	0
15 tons of super	78	15	0
375bush. seed at 3s. 4d.	62	10	0
Depreciation of farming plant	20	0	0
Interest at 2½ per cent. on £1,000 plant	25	0	0
15 bales twine at £2	30	0	0
Sundry expenses, repairs, plant, &c.	20	0	0
Rates and taxes, telephone, insurance, &c.	40	0	0
Hired man at harvest time (including board and lodging)	**25**	**0**	**0**
Living expenses based on arbitration awards as cost of living for average family	**166**	**8**	**0**
	£767	**13**	**0**

300 acres crop yielding 25cwts. to the acre = 375 tons at £2 per ton, £750.

It will be seen on the above figuring, which is very conservative, that hay cannot be grown for less than £2 per ton as an average, and then **it is necessary to sell it out of the stack. Also note that it is necessary to have feed paddocks to keep the hay for fodder down to 6 tons per horse.**

The amount for living allowance, £166 8s., is largely offset by eggs, butter pigs, meat, sheep, &c., produced on a well-managed farm, but at the same time it does not lessen the cost of hay growing. It is a profit derived from **sidelines. Note that no interest is allowed the owner for money invested in the land. Careful management will have to be exercised to keep expenditure within the above estimated figures. No holidays, sickness, accidents, or schooling,** motor cars, radios, &c., **are provided for in the above estimated expenditure.**

Above figures are ample proof that it costs over £2 per ton to grow hay and £120 to feed 10 horses for 1 year for power.

The following costs are based on figures supplied by several tractor owners, and for working the land for 12 months from January to 31st December as follows:—

	£	s.	d.
Cultivating 300 acres at 7d.	8	15	0
Combining 300 acres at 7d.	8	15	0
Harrowing 300 acres at 2d.	2	10	0
Fallowing (ploughing) 300 acres at 11d.	13	15	0
Cultivating 300 acres at 7d.	8	15	0
Cultivating 300 acres at 7d.	8	15	0
Harrowing 300 acres at 2d.	2	10	0
Harvesting 300 acres at 7d.	8	15	0
Total	**£62**	10	0

Working 300 acres 8 times each year with a tractor as follows:—Ploughing at 11d., cultivating three times at 7d., harrowing twice at 2d., combining at 7d., harvesting at 7d.:—

	£	s.	d.
Kerosene for working 2,400 acres	62	10	0
Depreciation	37	10	0
Maintenance	10	0	0
Interest on tractor, £215 at 7 per cent.	14	15	0
	£124	15	0

Horspower—

	£	s.	d.
12 horses to maintain a 10-horse team, each horse eating 5 tons of hay per year valued at £2	120	0	0
Depreciation based on fact that average life of horse working is 13 years	25	0	0
Maintenance, allowing for deaths, harness, shoeing, veterinary, fences, troughs, &c.	10	0	0
Seed and super for early feed	30	0	0
Interest on 12 horses valued at £25 at 7 per cent.	21	10	0
Interest on 60 tons of hay valued at £3 at 7 per cent.	15	15	0
	£221	15	0

	£	s.	d.
Farming with horsepower	221	15	0
Farming with tractor	124	15	0
Balance in favour of tractor	£97	0	0

Other savings made through tractor farming are:—(*a*) 120 sheep at 10s. each per year, £60; (*b*) extra time and labour for secondary industries. In other words a tractor will provide the power to work the farm for 8s. 4d. per acre, whereas horses cost 14s. 9d. per acre, the tractor showing a saving of 77 per cent. over horses.

All the above figuring is based on good years and when times are normal. At the present time hay is bringing an extraordinary high price, not because an improved market has been found, on the contrary, hay is high in value because unfortunate fellow farmers through drought conditions cannot grow enough fodder to feed farm stock. Unless you can grow hay on your farm for 17s. 6d. per ton tractor fuel is considerably cheaper. Opponents to tractors cannot grow hay cheaper than £2 per ton, and it is quite plain that they do not know what it is costing them to feed horses.

Science and advanced engineering have produced for the farmer a piece of mechanism that will compete with horses and reduce his farming costs. It is a continuation of the progress from the scythe and sickle.

DISCUSSION.

Mr. W. Starkey did not favour the tractor on account of having to import all fuel from U.S.A. Tractors were dangerous in summer time on account of fire. Mr. A. Herbert said that the costs of horses quoted were not exact enough. Advised the rearing of foals, but agreed that tractor may be pleasanter to work. Mr. G. Henderson said that tractors owned by settlers in Western Australia were discarded when the country was at all settled. Mr. W. Hamdorf said that tractor and horses were not a good combination, as there was too great an outlay of capital for the period of work every year. Mr. L. Belling thought horses were the better proposition of the two, as a tractor owner would have to be a good mechanic. Mr. V. Hamdorf said that the depreciation and the repair bill allowed for a tractor was not nearly large enough as gained by his experience of tractor farming. Hay could be grown for 15s. a ton. Mr. S. V. Herbert said that accidents could happen to both units of power, but he favoured suction gas or crude oil in preference to kerosene tractors. (Mervin P. Hamdorf, Honorary Secretary.)

HAY MAKING.

The following paper was read by Mr. A. F. Roennfeldt at a meeting of the Greenock Branch on 16th December:—

As hay is the main fodder for all farm animals it is essential that all wheats sown for hay should be of good feeding quality. Hay grown on hard red soils is far more nourishing than that sown on black or Biscay soils, on which it grows rank and bulky. This, however, is generally cut for hay, as the return per acre is more than if left standing for stripping.

When cutting hay the grain of wheat in the head should be fairly well developed. If left standing too long, the straw of the hay becomes too white, and the mice do more damage in the stack.

Stooking should be done as soon as possible after hay cutting, as the hay keeps its colour, weight, and shape better than if left lying about for some days. If a little care is taken with stooking there should be very few stooks and twisted sheaves blown around the paddock. A good method of stooking is to stand four sheaves in a row, two on each side, then one layer right around with knots outwards, with the finishing sheaf on the western side.

The most important part of hay making is the stacking, as this is to preserve the hay from the year's rain. A thick layer of straw for the foundation of the stack should be used in order to keep the damp from the ground out of the hay. The hay stack should not be built too wide. A wide stack often has a shallow roof, which has a tendency to let water enter the hay. Keeping the centre of the stack about 2ft. 6in. higher than the outside sheaves of the layer is the most important part of stacking, in order to keep unsightly props and posts from the ends of haystacks.

Thatching the stack should be done immediately after the stack is finished, using good long straw carefully straightened, and put on in a thick layer. Wires across the stack should be 2ft. 6in. apart and anchored down with heavy weights or stones. It is always a good plan to have a little extra hay over at the end of the year, as it reflects bad management on the part of the farmer if he has to buy hay.

Mr. N. Fotheringham, Manager of the Orchard, addressing the visitors on the "Furrow Irrigation Experiments" at the Berri Experimental Orchard on the occasion of the Annual Field Day of the Berri Agricultural Bureau.

TOP DRESSING OF PASTURES.

The above was the subject of a discussion at a meeting of the Tantanoola Branch held on 1st February. Members agreed that a heavy application of super was advisable in the beginning. Mr. Altschwager strongly recommended sowing pastures with suitable grasses, which he claimed was much more profitable than relying upon the native grasses. He believed that rye grass and strawberry clover made the best pasture, and stressed the necessity of a heavy initial dressing of superphosphate. Mr. L. Anness strongly favoured a liberal application of super during the first year of operations. That landholders in Victoria were much more successful with pastures than those in South Australia was, in his opinion, attributable to the more liberal use of super in Victoria. He recommended using a bag of super per acre in the beginning. Mr. Anness strongly advised pasture harrowing on pastures where dairy cows were grazing. The breaking up and more equal distribution of manure over the surface was in itself a form of top-dressing. Cows should be kept off the land for a few days after harrowing. (Secretary, L. J. C. Osborne.)

BREAKING UP ROUGH LAND.

In the course of a paper read at a meeting of the Allandale East Branch on 7th February, Mr. F. W. Thompson dealt with his experiences in breaking up rough ground. He stated that in its original state their land was as rough as any in the district. After grubbing thick wattles and bushes they commenced to plough the land, which was very stony and gravelly, using a single-furrow plough and two horses. A stump-jump plough was used next year and proved much easier for the man although harder on the horses. It was found that using four horses in a two-furrow stump-jump plough was most satisfactory, giving sufficient power to plough fairly deeply, thus removing as many stones as possible during the first year. Two men followed the plough with pick and hammer to remove what stone the plough had missed. The first crop was generally poor but the second crop was much better. Although the cost of the first breaking-up was high, they were well repaid during later years by good cuts of meadow hay. The best time to plough was when the land was wet, because it was much easier to remove the stone from wet land. It was usually a problem to dispose of the ploughed-up stone, there being no sale for flint in the district. They had built the stone into walls for fencing. Although it took a great deal of work, when such a fence was built it was everlasting, besides being a good shelter for stock, an excellent firebreak, and looking better than heaps of loose stones scattered over the property. The small stones which came to the surface in later ploughings were used for making roads and cattle tracks through boggy places and around yards, sheds, &c. Although the breaking-up of rough country entailed much hard labour and expense, it was the best means of improving the stock carrying capacity. During the discussion Mr. Thomson stated that the most suitable method of levelling the land was by several cross-harrowings. This method was better than by rolling, &c. Replying to a member who asked how top-dressing had improved the unploughed land compared with that which was ploughed, Mr. Thompson said that although the uncultivated land had been improved, the cultivated land grew a better class of pasture and made better growth. (Secretary, R. T. Laslett.)

Mount Compass Agricultural Bureau Field Day on Mr. M. Jacobs' property, 6th February, 1936.

HARVEST REPORTS.

At a meeting of the Wasleys Branch on February 6th, Mr. C. Carmichael reported that the season was marked by scanty rains. Although the monthly falls were fairly evenly distributed, only during one month was more than 2in. received. The harvest opened unusually early, and by mid-October hay cutting was general. Thirty acres of Sword wheat cut for hay were estimated to yield 2 tons, a further 50 acres were reaped, yielding 30bush., but the grain was very light. A second paddock of 222 acres was sown with 60 acres of oats, 10 acres Ghurka, 30 acres Golden Return, 100 acres Ford, and the balance Nabawa. The oats yielded 2 tons per acre. The Ghurka did not do well, and the Golden Return was shrivelled on the red patches; the remainder of the crop grew well, and returned 8 bags. All the wheat was sown at the rate of 75lbs. of seed and 90lbs. super per acre. A crop of malt barley was badly affected by strong winds after reaping was commenced, and returned 6½ bags per acre. Thirty acres of Cape barley yielded 30bush. per acre, and was unstained. Mr. A. Helps reported that of the 3 varieties sown, namely, Ranee, Sword, and Ghurka, Ranee yielded 23bush per acre, Sword and Ghurka each 19bush. A return of 4bush. more was obtained from fallow land left out to grass over that from land following a cereal crop. Sword sown with a mixtue of 50-50 super and carbonate of lime (1cwt.) sown on heavy land yielded 3bush. more than that sown with 1cwt. of superphosphate. Malting barley yielded

21bush. No difference was obtained where super and ammonia were applied. Mr. E. W. Day stated that Sword had proved superior throughout the district, being outstanding in the Central Crop Competition. It was subject to smut, and therefore should always be pickled. Several crops of Sword entered in the Competition had received setbacks due to smut. Dundee was a good variety for the district, but the recent baking tests had proved that it was not such a good flour wheat as was reported early in the season. Felix had yielded well on account of the absence of rust during the season. Mr. T. W. Day reported that a frost late in the season had greatly reduced the yield, his crop averaging 24bush. Sword A yielded 30bush. and did not shake in the boisterous winds as did ordinary Sword.

Dudley Branch.—At a meeting held on February 4th Mr. G. Mayfield reported that experiments with varying quantities of seed showed that 65lbs. seed and 95lbs. super yielded about 25bush., a seeding of 80lbs. seed and 95lbs. of super giving a yield of approximately 31bush. Mr. L. Longbottom reported good results from Dundee wheat, which yielded 10 bags per acre, stood up well, and did not shake. It reaped well, and gave grain of good weight. Ranee 4H, however, yielded 2bush. or 3bush. better. Turvey did not yield well. Mr. A. G. Telfer reported no appreciable difference in yield between Ranee, Ranee 4H, Ghurka, and Dan. When fed off, sheep showed a preference for Ghurka, and fed it closer. Stubble crops, peas, oats, and barley were disappointing, largely owing to dry spring conditions. A patch of Early (Dwalganup) Subterranean clover had made good growth.

Alma Branch.—Eight members attended a meeting on 4th February. Mr. W. H. Brown reported that Sword returned 12 bags, Waratah 10 bags, and Marathon 25bush. Nabawa was disappointing, yielding 18bush. Hay averaged 30cwts., and barley 8 bags. Mr. R. McKenzie reported a return of 30bush. from Sword; Nabawa yielded 7 bags, with a coarse straw and tight heads; Wandilla, 7 bags; and Croston, sown early, 21bush. Smut was the only disease. A test plot sown at the rate of 1cwt. per acre of super and ammonia yielded 1 bag per acre more than a plot which received 90lbs. of super only. Mr. M. McKenzie stated that Sword had returned 9 bags in one field and 10 to 11 bags in another; Waratah, a good crop, yielded 9 bags; Nabawa broke off badly, yielding 7 bags; Marathon also broke off, yielding 6 to 7 bags. Smut was the only disease. Mr. H. B. Freebairn had received the best return from Ranee 4H, which gave 11 bags. Ford returned 30bush., and Sword, which had been fed off, 30bush. The Sword which was not fed off yielded 8 to 9 bags; Waratah, 6 to 7 bags; Caird, a wheat which had given good results, yielded 9 to 10 bags. Mr. A. E. Day reported Dundee, 11 bags; Waratah, 10 bags; Ranee, 8½ bags; Nabawa, 8 bags; and Sword, 9 bags. Dunn's and White peas were raked and stacked, and were being fed to sheep with good results. Mr. A. R. Smyth reported that Dundee and Ranee returned 14 bags, weighed well, and gave a good sample. Ford (13 bags) and Sword (11½ bags) were disappointing; Nabawa went down, yielding 10 bags, and Marathon, which broke off, gave 39bush. The disease "failure to fill" affected Dundee and Ranee, as well as smut and flag smut on limestone soil. Mr. E. H. Drescher reported Sword, 8 bags, and Nabawa, which broke off, 7 bags. Members reported damage to barley by heavy winds which adversely affected the yield.

Boor's Plains.—At a meeting held on 6th February 28 members and visitors were present. Harvest results were discussed, the average return for the district being 20bush.

Jamestown.—Meeting held 17th February. The average yields per acre of wheats were reported as:—Carrabin, 24bush.; Dundee, 29bush.; Sultan, 27bush.; Nabawa, 27bush.; Ranee 4H., 31bush.; Gallipoli, 27bush.; Sepoy, 30bush.; Currawa, 25bush.; Sword, 25bush.; Ranee, 28bush.; and Ghurka, 23bush. Oats—Early Burt, 18bush. Mr. A. J. Symonds reported that 3 plots of oats sown as Departmental Experiments resulted as follows:—1cwt. super per acre, 15bush.; 2cwts super and 1cwt. ammonia at rate of 2cwts. per acre, 18bush.; 1cwt. super and 1cwt. ammonia at rate of 2cwts. per acre, 25bush. Members had noticed that the straw of Currawa, Sepoy, and tough Gallipoli was eagerly sought out by stock, while that of Ranee and Nabawa was practically ignored. The increased feeding value of the straw helped to compensate for decreased yields in the first-named varieties.

Gladstone.—A meeting was held on 12th February, each member present giving a report of his harvest result. Mr. Fisher reported having experimented with Bogan, a New South Wales wheat. Mr. Prior advocated the use of a culti-packer, which had prevented his wheat from thinning out. Mr. E. L. Orchard (District Agricultural Instructor) commented upon the crops of the district.

Redhill.—Six members were present at a meeting held on 11th February to discuss harvest results. Mr. Bentley reported his poorest crop since 1914, due to lack of rain and dry, windy periods. His rainfall was about 12in. for the year, although only 5 miles north of Redhill the rainfall was nearly 17in. Waratah gave the best return, yielding about 7bush. Minister, S.H.J., Sword, and Dundee averaged 5bush. Barley and oats were a failure. Mr. F. A. Wheaton had sown one paddock with 1½cwt. of super, which returned nearly 2 bags per acre more than did a paddock sown with 100lbs. of super. Mr. G. A. Button reported that portion of a paddock which had been sown with oats previously showed a better yield than the other portion. Nabawa yielded best, but Ranee gave the heaviest grain.

Appila-Yarrowie.—At a meeting held on 7th February members reported that returns were approximately average for the district. Crops were affected by lack of rain, and frosts did some damage. Mr. E. L. Orchard addressed the meeting, and discussed the harvest results. Mr. Symonds, a visitor from Yankalilla, gave a brief outline of the country in the Yankalilla district.

Wilmington.—At a meeting on 12th February members reported yields varying according to the rainfall. Grasshoppers had done considerable damage in parts. Some good crops were obtained near the hills. Mr. E. H. Hampel reported yields from 18 to 30bush., Sword yielding 30bush., Dundee 27bush., and Gallipoli and Ranee 24bush. Practically all crops were sown in dry conditions, with super at the rate of 90lbs. per acre. Mr. J. J. Modystach received returns up to 25bush., and Mr. F. G. Schulz up to 24bush. Dundee gave promising results under dry conditions. Mr. E. L. Orchard spoke on the subject of wheat varieties.

Murraytown.—Members reported on harvest results at a meeting held on 1st February. Mr. F. C. Borgas reported that wheat sown at the rate of 60lbs. with 75lbs. of super had returned:—Ranee, 20 to 27bush.; Dundee, 9 bags. Ghurka was sown early, and suffered from lack of rain in early October. Oats had returned 10 bags. Mr. N. Scholz sowed 60lbs. wheat and 56lbs. super. Teagle yielded 10 bags of a good sample, Ranee 9 to 10 bags, Sword 7 bags, Free Gallipoli 9 bags, Ghurka 9½ bags. Mr. F. J. Tregenza stated that the distribution of the rainfall had been good for the growing of wheat on fallow, his fallow crops returning 10 bags, and 5 bags from stubble land. Guyra oats gave a good yield. Mr. W. Ryan reported that Sword had shaken badly, but yielded 10 bags. Mr. E. B. Pitman sowed 60lbs. to 65lbs. of wheat with 90lbs. of super. Dundee gave 10½ bags of pinched grain It was a good wheat to thresh, and held in the head well. Marshall's No. 3 returned 8 bags, Ghurka 8½, Rance 9 and 11 bags. All grain except Dundee was of excellent sample. Rance had shaken out approximately 1bush. per acre.

Laura Bay.—Meeting held 11th February. Mr. W. Edson reported Ranee with a yield of 16bush. per acre and Canberra affected by rust. Mr. J. W. Blumson reported considerable damage by wind and rust. Waratah returned 7bush. Red rust was prevalent throughout the district, and the dry mid-winter conditions were responsible for many disappointing yields. A paper, "Scrub Clearing" was read by Mr. M. Lowe.

Coonalpyn.—The subject of the meeting on 5th February was reports by members on their harvest results. Results from wheat were generally on the poor side, although barley and oats gave a better return. One or two crops from a limited area returned approximately 5 bags per acre, but the majority were not over 5busn. Mr. Venning reported that from a self-sown crop of 20 acres of oats grazed until October he had reaped 100 bags. Mr. J. Haydon had sown wheat and barley for 2 years, and during that period the barley returns had been treble that from the wheat.

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		South-Eastern District.		
Allandale East..	7/2/36	10	"Breaking up of Rough Ground"—F. W. Thompson	R. T. Laslett
Tantanoola	1/2/36	8	Discussion—"Top Dressing"	L. J. C. Osborne
		Upper North District.		
Murraytown ...	1/2/36	8	Harvest Reports	E. B. Pitman
Appila-Yarrowie	7/2/36	12	Harvest Reports	E. H. Wurst
Wilmington	12/2/36	16	Harvest Reports	Chas. Cole
Yandiah	14/2/36	11	Harvest Reports	E. C. Keller
		Mid North District.		
Narridy	1/2/36	21	Harvest Reports	J. Klingner
Beetaloo Valley	3/2/36	13	Discussion	B. W. Giddings
Redhill	11/2/36	6	Harvest Reports	L. Harris
Gladstone	12/2/36	9	Harvest Reports	Max Hoare
Booborowie	22/2/36	—	Address—C. A. S. Hawker, M.H.R.	A. T. Fairchild, jun.
Jamestown	17/2/36	7	Harvest Reports	R. B. Phillips

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
LOWER NORTH DISTRICT.				
Lyndoch	10/11/35	9	Discussion	J. S. Hammat
Lyndoch	7/1/36	9	Discussion	J. S. Hammat
Roseworthy	27/1/36	10	"Rugging Sheep"—F. E. Waddy	S. L. Bowden
Koonunga......	5/2/36	10	Address—Vacuum Oil Co.	H. Mibus
Light's Pass ...	3/2/36	21	"Dried Fruits"—A. Nitschke; "Drying Prunes"—L. Koop	C. A. Verrall
Nantawarra	6/2/36	—	"Tractor *v.* Horses"—A. Bryant	M. P. Hamdorf
Dudley	4/2/36	18	Harvest Reports	D. I. Telfer
Greenock	16/12/35	20	Papers (3)	A. H. Schubert
Greenock	20/1/36	14	Question Box	A. H. Schubert
Rosedale	10/2/36	15	Annual Meeting	W. Georg
Alma	4/2/36	8	Harvest Reports	E. H. Drescher
Black Springs ..	3/2/36	200	Address—W. J. Spafford	K. H. Dunn
Truro..........	17/2/36	14	Annual Meeting	L. S. Davis
Sutherlands	17/2/36	53	Address—W. J. Spafford	B. Doecke
Lyndoch	4/2/36	10	"Vegetable Growing"—J. B. Ruediger	J. S. Hammat
Wasleys	6/2/36	19	Harvest Reports	C. R. Currie
Hanson	4/2/36	80	Address—W. J. Spafford	M. de N. Lucas
YORKE PENINSULA DISTRICT.				
Kilkerran	3/2/36	8	Discussion	A. Sawade
Bute	13/2/36	10	Discussion	R. W. Langman
Boor's Plains ..	6/2/36	24	Harvest Reports	S. G. Chynoweth
Weavers	3/2/36	10	Discussion—Branding Stock	H. W. Cornish
Weavers	13/2/36	200	Lantern Lecture—C. A. S. Hawker, M.H.R.	H. W. Cornish
WESTERN DISTRICT.				
Kelly	1/2/36	25	"Bulk Handling Wheat" A. W. Christian, M.P.	F. R. Illman
Balumbah......	4/2/36	11	Address—H. D. Adams	J. E. Swann
Maltee	6/2/36	9	"Branding Livestock"—H. Box	E. Schwarz
Pinbong	16/12/36	13	Papers from Wudinna Conference	D. O. Scholz
Pygery	4/2/36	6	Discussion	A. Day
Yadnarie.......	6/2/36	—	Dance	E. A. Spriggs
Laura Bay	11/2/36	14	Harvest Reports. "Scrub Clearing"—M. Lowe	P. S. Morrison
Green Patch ...	6/2/36	16	Discussion	C. J. Whillas
Lipson	15/2/36	9	Discussion	M. Barraud
EASTERN DISTRICT.				
Chapman Bore..	11/11/35	13	Paper—C. Menadue	J. P. Krollig
Devlin's Pound .	29/1/36	60	Address—W. J. Spafford	H. A. Loffler
Coonalpyn	5/2/36	18	Harvest Reports	C. C. George
Ramco	7/10/35	8	Discussion	J. J. Odgers
SOUTH AND HILLS DISTRICT.				
Hartley	5/2/36	16	Visit from Belvidere Members	W. J. Brook
Lobethal (Tweedvale)	16/1/36	25	Address—W. J. Spafford	B. Schapel
Cherry Gardens	1/2/36	—	Visit to F. Redden's, Cudlee Creek	A. R. Stone
McLaren Flat...	6/2/36	26	Question Box	P. T. Wait
Shoal Bay......	11/2/36	11	Discussion	E. B. Bell
Blackheath	13/2/36	6	Question Night	E. H. Paech
Monarto South .	15/2/36	26	"Mistakes Made in Australia"—W. Giles	C. F. Altmann
Hope Forest....	3/2/36	11	"Establishing a Dairy Farm"—S. Coad	H. J. Hunter

WOMEN'S BRANCHES.

FIRST AID IN THE HOME.

[*An address given by Dr. S. C. Downing at the February meeting of the Gladstone Branch.*]

In this subject of first aid it is my intention to deal with a few of the more common accidents and mishaps occurring in everyday life, and to suggest suitable methods and simple means of treatment, and in the case of more serious emergencies to outline briefly the best procedure to adopt until such time as more advanced treatment is possible.

In every case the methods or means suggested will be those requiring no special technique, and should be at all times available in the average home.

Simple Wounds and Abrasions.

Regarding these little need be said as the primary factor to be observed is cleanliness. They should be thoroughly washed, preferably using boiled water, and if very dirty there is no objection to the use of soap, a superfatted soap such as Castille or Palmolive being the best. The soap should always be washed off. Remove any foreign particles such as glass, metal, or gravel. Hydrogen peroxide is a good cleansing agent, and when thoroughly clean touch lightly with weak iodine, and apply a clean dressing.

Do not be alarmed at a little bleeding, as this has a cleansing effect. If profuse it can often be controlled by the application of firm pressure over the site of the injury. If, however, the bleeding cannot be controlled by this means and becomes alarming, a tourniquet may have to be applied until such time as the bleeding point can be secured. An ordinary twisted handkerchief will make a satisfactory tourniquet, and is applied tightly above the bleeding point. It can easily be remembered that in the case of wounds of the hand or forearm it must be applied above the elbow, and in wounds of the foot or lower leg it must be applied above the knee. It should not be left in position longer than half an hour before being released, and if necessary re-applied.

Insect Bites and Stings.

These are of extremely common occurrence, but it is fortunate that in this part of the world, apart from the local reaction, they rarely cause serious complications. The first step is to remove the sting if present, and this can usually be done by gentle wiping. For bee stings it is usually sufficient to apply a compress of equal parts of ammonia and water. For wasp stings, equal parts of vinegar and water. Spider and scorpion bites may be treated with a strong solution of washing soda, and in all cases, if very painful, hot fomentations of carbonate of soda, a tablespoon to the pint, usually gives relief. The old-fashioned blue-bag, or the juice of an onion is not to be despised, and is often efficacious.

Foreign Substances in Eye, Ear, Nose, and Throat.

(*a*) *Eye.*—In all cases, particularly in children, avoid rubbing the eye. If the foreign body is embedded in the substance of the eye, make no attempt to remove it. Instil a few drops of olive or castor oil, and bandage the eye. If, however, it is loose and can be easily seen it may be wiped off with a fine brush, the twisted corner of a clean handkerchief, or a wisp of moist cotton wool.

If situated under the upper lid it may sometimes be wiped out by pulling forward the upper lid and pushing the lower lid up underneath it, and repeating this procedure several times.

(*b*) *Ear.*—If the foreign body is an insect it may sometimes be washed out by filling the ear with warm oil, but on no account should the ear be probed or any force used, as it is very easy to damage the sensitive structure of the ear-drum.

(*c*) *Nose.*—If vigorous blowing with the free nostril blocked is unsuccessful, encourage sneezing by inhaling some irritant substance such as pepper or mustard.

(*d*) *Throat.*—The source of trouble most common is a morsel of meat, a piece of bone, or even false teeth. Vigorous thumping between the shoulderblades sometimes has the desired effect. If not, pass two fingers back over the tongue and endeavour to pull up the obstruction.

Simple Sprains.

In a sprained joint it is important that one should always remember the possibility of an underlying fracture, and if any doubt exists further advice should be sought. If seen at the time of injury apply cold compresses and bandage firmly over a layer of cotton wool.

If the swelling becomes excessive and the pain acute, alternate hot and cold fomentations, followed by firm bandaging as before, should give relief. Passive movement and massage should be adopted after 48 hours. If the ligaments are badly sprained or torn some special form of strapping will probably be required.

Fractures.

In the case of fractures, unless one possesses some advanced knowledge of First Aid work I advise gentle handling and as little handling of the affected part as possible, as it is exceedingly easy in some cases to convert what might be a simple fracture into one of a far more complicated nature.

About all that can be done in the home is to immobilise the part in the most comfortable position. It is well to remember that an anaesthetic may have to be given, and to refrain from giving food.

Burns and Scalds.

These injuries are relatively common, and it must be emphasised that in burning or scalding accidents, where the area involved is extensive, no matter how superficial, the condition should be regarded as a serious one. All burning patients suffer from shock, and the first essential is that they be kept warm, and the burnt part not exposed to the air more than possible. Stimulants should be given —strong coffee being quite suitable and usually readily obtainable. Clothing must be removed very carefully, if necessary cut away. Where the clothing is adherent it should be carefully soaked off with a warm solution of carb. soda. The old, time-honoured custom of applying some oily or greasy substance such as olive or carron oil dies very hard, but it is not to be recommended, as it tends to interfere with the more modern methods of after treatment, and also favours the formation of septic conditions. Simple and small burns usually respond quite well to carb. soda compresses, followed later by some simple dusting powder. More extensive and severe burns may also be treated with carb. soda compresses until further treatment is available.

Fainting, Fits, Convulsions.

With the treatment of a simple fainting fit not due to injury most people are probably conversant. The clothing should be loosened, the head placed in a low position, and as much fresh air obtained as possible. If able to swallow, stimulants such as hot strong coffee or brandy may be given.

Fit.—These may be of various natures. All that can be done in the home is to see that the patients do not injure themselves. Remove all breakable articles, and prevent the tongue being bitten by separating the teeth with some blunt instrument.

The hysterical fit is of a different nature, and the difficulty in these cases is in arriving at the correct diagnosis. Hysteria is more commonly found in young girls. The patient rarely becomes fully unconscious, and never under any circumstances hurts or injures herself. The commonest manifestations are uncontrollable screaming, and often alternate fits of laughter and crying, combined with some form of convulsive movement. The treatment in these cases should be entirely unsympathetic. Sometimes complete isolation will suffice, but often more extreme measures have to be resorted to, such as a douche of cold water to the face or [illegible] shaking.

Convulsions.—These commonly occur in infants, and the only home measure available is the hot bath. Mustard may be added in the proportion of 2 tablespoons to 5galls. of water, and the temperature of the water should not be above 105° F.

Poisoning.

A subject of this magnitude can be only very lightly dealt with in a paper of this nature. As there are between 130 and 150 classified poisons it is quite impossible to deal with the specific treatment for any individual one, and it is proposed, therefore, merely to outline a few general measures of treatment which can be readily applied at home. In corrosive poisoning an emetic is *never* given, whereas in all other poisons this should be the first line of treatment adopted. The corrosive poisons are divided into *Acids and Alkalies*, and if these have been swallowed there is almost always visual evidence of burning of the lips and mouth. The *commoner* acids are spirits of salts, carbolic, phenol, lysol, and most household disinfectants. For these the best antidotes are chalk, whiting, lime water, carbonate of soda, or even plaster from a wall mixed with water in the proportion of 1 tablespoon to the pint. The commoner alkalies are caustic soda, caustic potash, and ammonia. For these the most readily procurable antidotes are vinegar or lemon juice in equal parts of water. In all corrosive poisons olive oil may be given. *In these cases never give an emetic.*

Non-corrosive Poisons.—These cover a very wide range, but are not so frequently met with in general practice, the commonest probably being the various forms of vermin poison, which usually contain some form of arsenic or strychnine. There are many forms of drug poisoning, but these are not commonly met with. *In all of these cases give an emetic immediately.* The commonest emetics are mustard or salt, 1 tablespoon to a tumblerful of lukewarm water and repeated if necessary. If this does not have the desired effect pass the fingers over the back of the tongue and endeavour to produce vomiting by tickling the back of the throat. After vomiting has been produced, any of the following may be given in all cases of poisoning:—Milk (milk and raw eggs beaten together), milk or cream and flour in a thin paste, olive oil, cod liver oil, and strong tea.

All poison cases suffer from severe shock, and it is of paramount importance that they be kept warm. At a later stage stimulants may be given, one of the best being strong black coffee. In cases of poisoning never give alcoholic stimulants. One common article found in most houses may cause poisoning, that is iodine, The treatment for this is simple and easily remembered, simply give ordinary starch mixed to a very thin paste with water.

It is consoling to note that the common species of venomous snakes are few in number. These in order of danger to man are:—(1) The Death Adder, (2) the Tiger Snake, (3) the Copperhead, (4) the common Brown Snake, and (5) the Red-bellied Black Snake.

The mortality following the bites of these species are:—Fifty per cent. for the Death Adder, 40 per cent. for the Tiger Snake, and less than 10 per cent. for the Brown Snake. It is doubtful if the bite of the Black Snake is ever fatal for an adult. Bites from the Copperhead are rare, although this is a very common species, particularly in swampy country.

First-aid treatment is somewhat limited, and varies with the site of the bite. If the bitten part be a limb, a ligature should be applied immediately above the injury. This may be left in position for half an hour, and then loosened until the part becomes pink with the entry of blood, and then re-applied. This procedure can be repeated every quarter of an hour up to 2 hours. If the victim possesses sufficient physical courage he may excise a small area surrounding the fang punctures, and rub in crystals of permanganate of potash. In the case of a bite on the finger more heroic measures have occasionally been adopted. Much research is being carried out in the endeavour to obtain a satisfactory anti-serum for injection purposes. This has been successfully obtained in the case of the Tiger Snake, an antivenene now being available, but this is not of practical use against the venoms of other varieties.

NEW BRANCHES.

During the past month Branches have been formed at Echunga and Yandiah, the respective Secretaries being Mrs. F. Dennis, Echunga, and Miss V. Keller, Booleroo Centre.

EXHIBITIONS OF WOMEN'S HANDICRAFTS.

The General Secretary has been advised that Exhibitions of Women's Handicrafts will be held by the following Branches:—McLaren Flat, 21st March; Morchard, 25th March; Balhannah, 28th March; Karte, 15th April; Parilla, 16th April; Narridy, 7th May; Belalie, 9th June.

WIRRABARA.

The December meeting of the above Branch was held on the 17th, and took the form of a Social Afternoon, being attended by 15 members and 4 visitors.

Economical Breakfast Dishes.

Reading a paper on this subject at the 16th January meeting of the Wirrabara Branch Mrs. G. Kranz said:—Breakfast dishes should be nourishing, sustaining, and quickly prepared. Porridge is one of the cheapest and best breakfast foods. It may be made from oatmeal or wheatmeal. Oatmeal is better for winter use as it contains more fat than wheatmeal. Eggs can be regarded as the second item for the breakfast menu. Being so quickly prepared and usually liked by most people, one can prepare an economical breakfast dish quite simply and yet vary it in so many ways, which is a problem solved. Poaching is one of the lightest forms of cooking eggs. Hard-boiled eggs are indigestible. The fresher the eggs the longer they take to cook. Eggs cannot be too fresh. From 3 to 3½ minutes will set the white. Then there is the usual winter morning's breakfast—fried eggs and bacon. Others again like curried eggs, but they take a little longer.

Curried Eggs.—1 dsp. flour, 6 hard-boiled eggs, 1oz. dripping, 1 small apple, ½pt. stock or water, 1 small onion, 1 small tomato or tomato sauce, 1tsp. lemon juice, 1dsp. curry powder, 1tsp. curry paste, 1tsp. coconut. Method.—Peel apple and onion, and cut into small dice. Mix curry powder, flour, and coconut together. Melt butter in small saucepan and make quite hot, then fry 2 minutes longer. Add flour, &c., stir out lumps, and add the stock or water. Stir over fire until it boils and thickens. Cook gently ½ hour. Then rub through a sieve, return to the saucepan, add lemon juice, and re-heat. Boil the eggs hard, shell them, and cut up roughly. Add to the contents of the saucepan and let them get quite hot. Pour on to a hot dish with a border of rice around. Garnish with slices of lemon and the yolk and white of an egg rubbed through a sieve separately. Other forms of cooking eggs are scrambled eggs, steamed eggs, buttered eggs, but, of course, breakfast dishes cannot consist of eggs alone. A very tasty and simply prepared dish is Potato Cakes and Bacon:—8ozs. potatoes, 3ozs. flour, 2 tablespoons milk, 2 tablespoons clarified fat, ½lb. bacon. Boil potatoes and mash. Season with pepper and salt, add flour, and rub in 2ozs. good clarified fat. Moisten with a little milk, turn out on slightly floured board, roll out about ¼in. in thickness, stamp out in rounds. Melt the fat, and when quite hot put in the cakes and fry until a light brown. Lift out on kitchen paper, and serve on a hot dish, garnish with a roll of grilled bacon.

Breakfast Wonders.—Cut small or mince any cold meat. Make a paste with cold potatoes, 1 egg, salt, and S.R. flour to bind. Roll out and cut with scone cutter. Place meat between two rounds of paste and press edges together. Fry golden brown. Although all these dishes may be very tempting, I prefer the most economical dish of all—a slice of crisp, brown toast with good butter on it, and a cup of good tea. Breakfast is the first supply of the bodily needs for the day's work. It should be simple, as little time can be given to its preparation, but nevertheless nourishing and suited to the needs of those who partake. Apart from the dishes mentioned fruit should be included, especially in summer.

COLD LUNCHES FOR HOT DAYS.

[Papers read by Miss P. Hean and Mrs. H. Kirk at the January meeting of the Auburn Branch.]

It is rather difficult for the housewife to prepare meals that suit the appetites of all, and much more so in summer than in winter. To present a hot mid-day meal when the temperature is at its highest often puts folk off the meal. A well-prepared cold lunch in summer can be made very tempting, such as dishes made from cold meat or fish. Where an ice chest is available cold lunches are much easier to prepare, but country folk who are without a cellar or cool safe have more difficulty in keeping food cool. However the resourceful woman has more ways than one of doing things. For instance, a good way to cool stewed fruit or a custard is to place the dish in a bowl of water with a wet cloth over it. Very often a fireplace in one of the coolest rooms of the house is the best place for this performance. Butter and fresh vegetables can be treated likewise. Cucumbers and beetroot can be freshened up in water. Lettuces may have a wet cloth placed over them or, if desired, put in water to keep them crisp. Jellies can also be stood in water with a wet cloth over them.

RECIPES.

Mayonnaise Dressing.—1 cup of cream or milk, 1 small cup of sugar, 1½ cups of white vinegar, 3 eggs, 2 teaspoons mustard, 1 teaspoon salt. Beat eggs, vinegar, sugar, and cream together, and put 2 tablespoons of butter into a saucepan. When melted add other ingredients. Stir until thick as honey, but do not let it boil. This dressing keeps for 3 months.

Tomatoes and Peas.—Take 6 nice-sized tomatoes, cut off the tops, then take a teaspoon and take out the centre of tomatoes without breaking the outside. Then fill with some cold cooked peas and serve with mayonnaise dressing.

Beetroot Mould.—Two bunches of beetroot, 1 small lettuce, 2 dessertspoons gelatine, 2 cups hot water, pepper, salt, and vinegar. Cook beetroot until tender. Peel, cut into slices, and line a fluted mould with the sliced beetroot. Then fill centre with small dice-shaped pieces of beetroot. Dissolve gelatine in hot water. Pour over beetroot, and allow to set. Garnish with shredded lettuce and sliced tomato. Serve with mayonnaise or vinegar.

Spanish Cream.—½oz. gelatine, 3 eggs, 2 cups milk, 2 tablespoons sugar. Put the milk and gelatine in a saucepan, and put on fire until it dissolves. Beat the yolks of eggs and sugar together. Add to the milk and gelatine, and stir until it just boils. Cool and add the stiffly-beaten whites of eggs. Flavour with vanilla. Pour into a wet mould and set aside to cool.

Mrs. Kirk's paper read as follows:—Some of the most necessary things for the housewife to have in the cupboard for summer are the following articles:—Tins of camp pie, fish, and other meats to be kept, because fresh meat is not always available in the very hot weather on farms Therefore meals can be prepared without the least anxiety with these kept on hand. Gelatine can also be kept, and a variety of dainty and appetising dishes can be prepared from tinned fish and other cold meats. It is also of great value in helping to make a variety in the sweets. The following articles to help prepare sweets should be kept on hand, such as jellies, preserved fruits, junket tablets, and various custard powders and essences. Fresh fruit and vegetables for salads can be procured at regular intervals, for there is nothing more nourishing and tempting when it is very hot than plenty of salads both vegetable and fruit and all kinds of stewed fruits which have become quite cold. Sometimes folk prefer vegetables left whole and cut them up themselves, such as tomato, cucumber, and onion.

Home-made Camp Pie.—1lb steak, 1 cup breadcrumbs, ½ nutmeg, ½ cup water, pepper and salt. Mince steak well, mix all together, put in mould, steam for 2 hours, and put in a cold place until perfectly cold.

Meat Loaf.—From stock, soup, or gravy, with small piece of meat. Take 2 cups of any liquid available, and bring to the boil, adding 2 dessertspoons of gelatine. Stir until dissolved, then remove from the fire and allow to cool. When the mixture begins to set, add 2 cups of any minced odd meats after mixing all together. Place in mould to set. When serving cut in slices and garnish with parsley.

Sheep Tongue Shapes.—2 dessertspoons of gelatine, 3 sheep tongues, 2 cups of hot water or stock. Boil tongues until tender, skin, and slice finely. Arrange nicely in round cake tin. Fill tin with slices, then dissolve gelatine in clear hot stock or water, add pepper and salt, pour over tongues, and allow to set. Turn out and garnish with lettuce, tomato, and parsley.

Salmon Mayonnaise.—1 small tin salmon, 1 lettuce, 3 tomatoes, 1 onion. Mayonnaise:—2 hard-boiled eggs, ½ cup of milk or cream, 2 dessertspoons of sugar, 1 tablespoon of vinegar. Open tin of salmon on a soup plate, break it up with a fork finely, and then divide in 3 parts, placing one part in a salad bowl, then a layer of onion, then a layer of tomatoes, and then a layer of lettuce, and then continue the other two parts likewise until the bowl is filled. Make the mayonnaise dressing and pour over it, and cut 1 egg in rounds and place on top. Stand for a few minutes, and it is ready for use.

Salmon in Jelly.—2 dessertspoons gelatine, 1 small tin salmon, 2 cups hot water, juice of 1 lemon, 1 hard-boiled egg, pepper and salt. Take tin of salmon and open in basin, break it up with a fork finely, then dissolve the gelatine in hot water, adding juice of lemon, also pepper and salt. Mix all thoroughly together. Wet a round mould, and place slices of hard-boiled egg at the bottom, then pour the mixture in very gently, and allow to set. Garnish with shredded lettuce, slices of tomatoes and lemons. Serve with vinegar.

OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
WOMEN'S BRANCHES.				
Wirrabara	17/12/35	19	Social Afternoon	Mrs. A. Curtis
Wirrabara	16/1/36	21	"Breakfast Dishes"—Mrs. G. Kranz	Mrs. A. Curtis
Auburn	31/1/36	17	"Cold Lunches"—Miss Hean and Mrs. H. Kirk	Miss L. J. Dennison
Wilkawatt	21/1/36	20	"Copha" Cakes—Mrs. G. Oram	Mrs. H. Pritchard
Clare	1/2/36	37	Formal Business	Mrs. A. Pollock
Boor's Plains	6/2/36	19	"Sickness in the Home"—Mrs. T. Rodda	Miss L. Stanway
Echunga	5/2/36	19	Inaugural Meeting	Mrs. F. Dennis
Narridy	1/2/36	20	Question Box	Miss B. J. Reynolds
Hope Forest	6/2/36	—	Address—Mrs. N. Brookman	Miss M. E. DeCaux
McLaren Flat	6/2/36	12	Discussion	Mrs. B. Powell
Yurgo	27/1/36	10	Social Afternoon	Mrs. R. E. Sanders
Yandiah	14/2/36	19	Inaugural Meeting	Miss V. Keller
O'Loughlin	6/2/36	11	Arrangements for Exhibition at Conference	Mrs. E. Lutz
Nelshaby	6/2/36	16	"A Week's Menu"—Misses D. Jose and D. Noble	Miss A. M. Lawrie
Wasleys	6/2/36	26	"Music"—Miss F. L. Barnet	Miss G. Harding
Warramboo	7/2/36	12	Congress Report—Mrs. Steer	Miss J. P. Patterson
Karte	5/2/36	27	Discussion *re* Exhibition	Mrs. F. N. Atze
Penola	5/2/36	31	Cake and Marmalade Competitions	Mrs. F. J. Kidman
Gladstone	11/2/36	30	"First Aid"—Dr. Downing	Mrs. L. J. Sargent
Rendelsham	5/2/36	5	"Cold Sweets for Dessert"—Mrs. Foster	Mrs. W. Bignell
Balhannah	19/2/36	25	Travel Talk—Mrs. H. N. Wicks	Mrs. D. Camp
Coonawarra	12/2/36	30	Discussion	Miss O. A. Lear
Monarto South	15/2/36	33	Social	Mrs. F. W. Liebelt
Wilmington	13/2/36	43	Social and Antique Afternoon	Mrs. P. Cole
Myponga	13/2/36	7	"Pickles and Jams"—Mrs. Magor	Mrs. M. Bounds
Kybybolite	4/2/36	20	Discussion	Mrs. W. D. Kekwick
Maltee	6/2/36	8	"Sponge Cake Fillings"—Miss L. Schwartz	Mrs. J. A. Ferguson
Wirrabara	20/2/36	26	Fruit Preserving Demonstration—J. B. Harris	Mrs. A. Curtis

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All communications to be addressed:

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, 1936.

Dairying, at Strathalbyn, Thursday, 21st May (Mr. Reg. Sissons, Strathalbyn, Secretary).

River Murray, at Block E, Thursday, 18th June (Mr. J. C. K. Brigham, Box 65, Renmark, Secretary).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Dried Fruit Beetle.

Specimens of insect infested currants were forwarded by the Ramco Branch of the Agricultural Bureau to Mr. A. G. Strickland, M. Agric. Sc. (Chief Horticultural Instructor), who says the larvae present in the currants have been identified by Dr. J. Davidson of the Waite Institute as those of the so-called dried fruit beetles. These insects and their larvae occur on flowers and fruit in orchards (such as fermenting figs, split stone peaches, &c.), and on fruit in drying trays or on racks.

These larvae are not those of the more troublesome dried fruit moths, and infestation of the fruit with such is not usually serious, as in the case of the moth larvae.

As the insects in question (dried fruit beetles) will breed in fermenting fruit in the open—whether on the ground or on the vine—it seems likely that the infestation has arisen even before fruit was taken to the drying ground. This season has been remarkable for the heavy rains which occurred in January, and which caused splitting, mould, and fermentation in currants on the vines. Under these circumstances, it is probable that the orginal infestation occurred much earlier in the season; it is good policy to cull out mouldy, split, or fermenting bunches before proceeding with drying. At this stage it is difficult to suggest any well defined measures of control; it is desirable, however, to speed up the drying as much as possible. Once fruit is in the case and treated with fumigant, such as Erinol, the infestation should not extend.

A general clean up of all rubbish on drying greens, in sheds, sweat boxes, &c., is essential, so that there will be no chance material in which the pest can breed.

Smut in Oats.

Mr. R. C. Scott (Supervisor of Experimental Work) has advised the Secretary of the Laura Bay Branch of the Agricultural Bureau that if oats badly affected with ball or loose smut should be used for seed, the smut spores attached to badly infested oat grains may be deeply lodged in the crevices or under the husk, and therefore are not readily attacked by the pickle used.

Consequently no treatment is likely to be effective in entirely destroying the disease, although the trouble will be lessened because of the destruction of the spores adhering to the seed coat. It is therefore not advisable to utilise badly smutted oats for seed, but if this is absolutely necessary, pickling with formalin is more effective than the other fungicides.

The Champion Wheat Crop.

At a special function at Yeelanna on 27th March, Mr. W. H. Watkins received from the hands of the Secretary of the Royal Agricultural Society (Mr. H. J. Finnis) the Championship Challenge Shield donated by the Society for the best wheat crop grown in the State-wide competitions conducted by the Department of Agriculture.

These competitions began in 1927, and competitors in the Flinders District on Eyre's Peninsula have succeeded in securing "placed" positions in six out of the nine Annual Competitions, and the six crops were all grown at Yeelanna. Messrs. Smith Bros. came third in 1927; Messrs. Aikenhead & Treloar, third in 1929 and second in 1931; Mr. R. R. Wilson, second in 1932; Mr. W. H. Watkins, third in 1934 and first in 1935. The residents of the Yeelanna district have reason to be proud of the distinction won by Mr. Watkins after such persistent efforts by their competitors to gain the major prize. The Shield will remain at Yeelanna until it is won by a competitor of some other district.

Hoary Cress.

A specimen of this troublesome weed has been sent from Paskeville for identification. Mr. Spafford has advised that if there is only one patch on the farm every effort should be made to eradicate it, and he suggested that the services of the District Agricultural Instructor should be sought in order to discuss the problem on the spot.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publications:—

"Herbs," Ministry of Agriculture, England, Bulletin No. 76. Price 1s. net.

"Australian Tea Trees and Their Economic Value," Bulletin No. 14. Price 6d. Published by Technological Museum, Sydney, New South Wales.

"Cultivation of the Australian Nut," Bulletin No. 2. Price 1s. Published by Technological Museum, Sydney, New South Wales.

AGRICULTURAL INQUIRIES.

Spontaneous Combustion in Meadow Haystacks.

What is the cause of spontaneous combustion in meadow haystacks?—Reply by Mr. W. T. Rowe, Director of Chemistry.

Spontaneous combustion occurs when a substance becomes heated to a point above its ignition temperature, then by some means air is supplied.

Spontaneous combustion in haystacks is due to the chemical combination of some of the constituents of the material with atmospheric oxygen, and unless due provision be made for the escape of the heat, its accumulation may raise the temperature to a dangerous degree. If the heat which is produced is prevented from being dissipated, the temperature will go on rising gradually. As the temperature rises the vigour of the combustion increases, and more and more heat is produced in a given time. Then the temperature rises more and more rapidly, until finally the combustible matter takes fire without the application of external heat, provided air or oxygen is in some way supplied.

According to Dr. Von Schwartz in "Fire and Explosion Risks" in grass, clover, hay, &c., the vegetable cell retains its vitality for some time after the hay has been cut; respiration continues and is accompanied by the generation of heat. To this heat must be added that produced by the vital activity of the never failing spores and germs of micro organisms; and finally seeds in germinating also develop heat.

None of these sources furnish heat that is appreciable so long as the conditions allow the heat to be dissipated. So soon, however, as the hay is piled up in such a manner as to retain the moisture present (a prime essential for the inception of the subsequent processes), then the escape of heat is prevented, though it remains harmless while a sufficiency of moisture remains, or is afforded a means of escape, or finally so long as the mass is pressed tightly enough to prevent the penetration of air into the heated portions of the stack.

Field Crickets.

In reply to a question from the Penola Branch on the best method of destroying crickets, Dr. J. Davidson, M.Sc., of the Waite Institute, states that the common black field cricket (*Gryllus servillei* Sauss.) sometimes occurs in large numbers during hot, dry weather. The eggs are laid on the ground under the cover of debris; the newly hatched insects gradually increase in size and moult at least five times before becoming adult.

The insects are night feeders; the males make a loud, piercing, singing noise, which is produced by the rubbing action of the overlapping wings. The insects may be destructive to pastures, field and garden crops; vines and the buds of orchard bushes and trees may be also damaged.

The control measures will depend upon the character of the area infested. The use of poison bait or spray as recommended for grasshoppers (see *Journal of Agriculture*, South Australia, 1934, vol. 38, p. 623) is the control measure usually employed.

NOTE.—The greatest care must be observed in the use of poison bait, owing to the danger to children and domestic animals.

The reference to the poison bait is as follows:—

The poison bait method is widely used. A bait consists of an inert carrier, a poison, and an attractive substance. Bran is a useful and efficient carrier, but other convenient materials, such as chaff, chopped fodder, or sawdust may be used where bran is not available. The carrier should break readily into small pieces when the bait is distributed; it must not deter the insects from feeding on the bait. Bran has many advantages as a carrier, and its high efficiency offsets its cost. Experiments should be made with suitable local materials.

Arsenical poisons have given the most satisfactory and consistent results; Paris green and sodium arsenite are generally used. The soluble forms of arsenic compounds kill the insects quicker than the insoluble forms. The solubility of certain compounds in 100 parts of cold water are given below:—

White arsenic (arsenious oxide), As_2O_3	1.2 parts
Sodium arsenite, Na_2HAsO_3	Very soluble
Sodium arsenate, $Na_3AsO_4 12H_2O$	26.7
Calcium arsenate	Insoluble
Lead arsenate	Insoluble

With soluble poisons the solution of the poison is poured over the bait carrier and thoroughly mixed; with insoluble poison the bait should be mixed dry with the carrier and then made into a mash with an appropriate amount of water.

The attractive agent in the bait greatly increases its efficiency. The evidence regarding the value of the use of molasses is conflicting; where this material cannot be obtained it would appear to be justifiable to use the bait without it. In addition to being attractive to the insects, molasses assists in keeping the bait moist for a longer period. Damp baits are more attractive than dry ones; salt is sometimes added to baits in order to assist in keeping them damp.

Other substances have been used in baits as attractants, such as crushed fruits. Further experiments are necessary on this aspect of baits.

The following formula has proved to be an effective bait in Australia:—

Arsenite of soda	½lb.
Molasses	4lbs.
Bran	24lbs.
Water	2½galls.

The arsenite of soda is dissolved in the water and the molasses added to the solution. The mixture is sprinkled over the bran, the whole being thoroughly mixed to form a crumbly mash. The amount of arsenious oxide present in the arsenite of soda is important; the formula refers to an arsenious oxide content of 80 per cent.

The bait is scattered over an area of about 30ft. wide in front of advancing swarms of hoppers. The amount of bait required per acre will vary with the character of the area. About 10lbs. of bait (dry) should be sufficient, but in practice the amount used may be greater than this; if laid too thickly, there is undue wastage of bait. The risk of poisoning stock is negligible if the poison bait is spread thinly as directed. Operators handling poison bait must observe commonsense precautions. Baits should be spread early in the morning; the hoppers become more active later in the day as the temperature increases. On cold days baiting is not so effective, since the hoppers are sluggish.

VETERINARY INQUIRIES.

[Replies supplied by the veterinary officers of the Stock and Brands Department.]

Worms in Sheep.

Hon. Secretary, Agricultural Bureau, Narrung, asks several questions relating to worm infestation in sheep.

(1) In what form does the worm enter the bowels of a sheep?

Reply—The only worm of sheep, the life history of which has been discovered is the *Haemonchus contortus* (wire worms) found in the fourth compartment of the sheep's stomach.

In the case of the *Haemonchus contortus*, it is the third larval form which has developed on the grass and in the soil which is swallowed and which, after being in the stomach for a month, becomes the fully matured worm. The female lays eggs which are passed out and which, if sufficiently developed, will produce the first larval stage of development of the worms in the soil. Two further stages (second and third larval stages) take place, but only after the third stage of development are the larvae capable of further development in the stomach of the host, *i.e.*, if the immature worm is swallowed before it reaches the third stage of development, it is not capable of developing into a mature worm.

(2) If "wormy' sheep were drenched and put in a fresh paddock, would the droppings from those sheep be harmful to other sheep not affected with worms?

Yes, because the eggs in the droppings if mature would develop further larvae.

(3) How long would a paddock that has had "wormy" sheep in have to be spelled (that is, sheep kept out of it) before it would be free of worms or clean to put fresh sheep in

It is generally considered that at least 12 months must elapse before such pasture could be freed of infection with worms. This means that no cattle, sheep, or goats should be allowed on it during that time, but it is pointed out that it is doubtful if any sheep free of worms could be found, and under favourable conditions of temperature and moisture such country would soon become re-infected.

Grease in Horses.

E.V.H., "Frances," has horse with oily fluid oozing from the skin just above the hoofs.

Reply—The condition is known as "Grease" and is very difficult to cure. The following treatment is advised:—

(1) Give the following drench after starving for 24 hours:—Raw linseed oil, 1 pint (draught horse 1½ pints); oil of turpentine, 2ozs.

(2) Subsequently give one tablespoonful of Fowler's solution of arsenic in a small damped feed night and morning for 14 days. Stop for one week, and then repeat for another 14 days.

(3) Apply the following dressings locally and alternately every four to five days:—

(*a*) Whale oil or linseed oil, 20 parts; powdered sulphur, 4 parts; oil of tar, 1 part (get oil of tar from chemist).

(*b*) Lead acetate, 1oz.; zinc sulphate, 1oz.; copper sulphate, 1oz.; water, 1 pint. (Before starting to apply this lotion, wash area with warm water and soap.)

Pigs Weak in Back.

Secretary, Chapman Bore Agricultural Bureau, Murray Bridge, reports pigs weak in back, suddenly fall to the ground when walking.

Reply—It is suggested that the supply of skim milk to the sow be increased, and, if possible, a proportion of it be fresh whole milk for 7-10 days. Further, if the young pigs are confined to a sty they should be allowed out.

The addition of a boiled rabbit to the ration occasionally will help.

The following mineral lick should be supplied:—Agricultural lime, 2 parts (it is essential that it be thoroughly air slaked); common salt, ½ part. Add 2lbs. to every 100lbs. of grain used.

Questions submitted at the Upper South-Eastern Bureau Conference, Bordertown, 15th April.

Entero-toxaemia.

Is vaccination against entero-taxaemia worth while?

Reply—The entero-toxaemia vaccine affords a definite protection to sheep against this disease, and the latest annual report of the Council for Scientific and Industrial Research states that "Field observations continue to indicate that vaccination is a successful means of prevention, and the number of sheep inoculated last season again showed an increase." For any sheepowner whose flocks are subject to losses from this disease it is certainly worth his while to employ the vaccine, which is relatively low in price, and the saving of but two or three animals will pay for the cost of the vaccination.

Sheep Dips.

Are there any regulations regarding the dimensions of sheep dips?

Reply—No. The regulation relating to the dipping of sheep in this State prescribes that all sheep within the proclaimed dipping area "must, between the period of 1st September in every year and the end of the following January, be dipped by wholly immersing them for a period of not less than one minute in an arsenical dip containing not less than 0.1 per cent. of arsenious oxide."

To regulate for any specified size of dipping bath to be used would not necessarily ensure that the above requirements were effectively carried out, and as this can be done in baths irrespective of their size (so long as they are big enough to permit of wholly immersing the sheep), it is left to owners to use whatever size of bath they wish in order to facilitate the work of dipping.

Itch in Horses.

What is the cure for itch in horses?

Reply—If a properly constructed horse dip is available, the animals can be stood for 15-20 minutes with their legs immersed in a 1 per cent. solution of any of the coal tar disinfectants (such as lysol, cresol, &c.). There are on the market a number of proprietary preparations of these, and if any of them are used, the strength of the dipping solution should be that recommended by the manufacturers. It is important when preparing the dipping solution to make certain that the disinfectant preparation will make a uniform and permanent admixture with the water beng used, and this is best done by first making a test with small quantities of the disinfectant and the water. If the water is found to be too hard to make a perfect mixture, it will have to be softened by the addition of washing soda. This perfect admixture between disinfectant and water is necessary to prevent any scalding of the animals' legs taking place.

While the animal is in the dip, a rag mop on the end of a stick should be used to work the solution thoroughly through the hair on the legs and on to the skin. The roots of the hair of the mane and tail can at the same time, if necessary, be treated by applications to the dipping solution.

The dipping should be repeated three or four times throughout the year.

Where this dipping process cannot be carried out, the animal's legs from the hoof-tops up to the knees and hocks can be given a good scrubbing with disinfectant solution as above, and then, after drying them out with clean rag, a little of any of the following dressings rubbed well into the roots of the hair:—

(1) Raw linseed oil and kerosine, equal parts.
(2) Raw linseed oil and turpentine, equal parts.
(3) Raw linseed oil, 1 pint; lysol, 1oz.

Two or three dressings with any of these at intervals of three or four days will usually suffice.

If necessary the mane and tail regions can be similarly treated.

It is advisable also, in addition to treating the animals, to clean up and disinfect the stables and harness.

SUMMER TEMPERATURES ON EYRE'S PENINSULA.

The Mangalo Branch asks:—"Are the summers on Eyre's Peninsula getting cooler? Old residents of the district state that there has been a steady decrease in burning weather during latter years."

This question was submitted to Mr. E. Bromley (State Meteorologist), who says:—"Temperature records at Kyancutta, the only inland Climatological Station on Eyre's Peninsula, are too recent for any comparisons to be made. I find, however, from an examination of the Adelaide records, which extend over a period of 78 years, that in both January and March the mean maximum temperature for the last 39 years (1897-1935) shows a falling off in temperature of 1½ to nearly 2 degrees from the first period of 39 years (1858-1896). In the other summer months, November, December and February, however, the temperature means for the two periods are practically the same, February showing a slight increase in the second period (1897-1935). The records certainly do not show a steady decrease in temperature in more recent years, in fact, the individual hottest months for November, December, January, and March occurred in the latter period, the most recent being the unprecedented hot March of 1934."

FIG TREES ON EYRE'S PENINSULA.

Specimens of fig fruits and leaves showing signs of withering were forwarded from the Petina Branch of the Agricultural Bureau to Mr. R. Fowler, of the Blackwood Experimental Orchard, for an explanation of the trouble. Mr. Fowler says:—

"From inquiries, I find that the average rainfall at the nearest recording station to Petina is only approximately 10in. to 11in., and I take it Petina would be about the same. I should imagine, therefore, that the very low rainfall would most likely account for the difficulty with the figs. While the fig will grow in dry situations, it must have sufficient moisture to support and preserve the foliage, if it is to produce and ripen its fruit. The condition of the leaves and fruit submitted appears to indicate lack of growth in the tree, no doubt due to lack of moisture. As with other fruits, the fig needs plenty of moisture, but not too much. If the soil does not retain the needed amount, naturally it must be supplied by irrigation wisely administered.

"There are instances of barren fig trees which persist in dropping their untimely figs year after year. This may be due to variety, locality, or lack of pollination in the case of the Smyrna type of fig. The remedy is grafting over barren trees with suitable scions, or in the case of the Smyrna, introducing the fig wasp. I note, also that the fig tree in question is only 6 to 7 years old. Young trees sometimes persist in the habit of not maturing their fruits for some years, but improve with age. I would suggest in this instance that the tree be liberally watered and mulched during the next season, and it might also be advisable to try the effect of pollenization with fig wasps The wasps can be supplied from our Experiment Orchards."

ACTIVITIES AT ROSEWORTHY COLLEGE, 1934-35.

PART III.

PROGRESS IN THE IMPROVEMENT OF THE BAKING QUALITY OF SOUTH AUSTRALIAN WHEAT.

[By ALLAN R. CALLAGHAN, D.Phil., B.Sc. (Oxon.), B.Sc.Agr. (Syd.), Principal, and E. J. BREAKWELL, B.Sc.Agr. (Syd.), Plant Breeder.]

THE PROBLEM.

Three years ago, a programme for the improvement of the baking quality of South Australian wheat was quietly initiated at Roseworthy College. In the last 12 months there has been a sustained attack on the quality of Australian wheat, and the matter has received the publicity its importance warranted. Indeed, so much has been written and discussed lately, relative to the problem, that the subject has become hackneyed.

Very varied interests are closely associated with the wheat industry, and the problem has naturally been approached from different angles. So that in spite of the fact that much has already been said about the baking quality of our wheat, it has chiefly emanated from diverse interests; the many points of view have tended to cloud the issue, and farmers for the most part have found it difficult to become truly acquainted with the facts of the position. For this reason an endeavour is made herein to review the whole field, summate the causes and the effects, and indicate the investigations necessary as correctives.

DEFINITION OF QUALITY.

It is necessary at the outset to define quality. The baking quality of wheat has not concerned the grower for the simple, understandable, and excusable reason that it has not meant extra returns to him. It is equally understandable that the average man concerned with wheat should find it difficult to fathom this sudden onslaught on baking quality when hitherto, grain was judged on its appearance and weight. The miller, on the other hand, must study baking quality, for he produces flour for bread making. In consequence, the baker insists on the miller supplying him with satisfactory flour for his purpose. In turn, the baker must follow the dictates of the consumer, so that actually the definition of quality rises as a direct issue from public demand. That demand in the case of bread is for a large well-shaped loaf, good in colour and texture, with crisp eatable crust; so that the baking quality of wheat is the capacity of the flour milled from it to produce loaves of good volume, shape, and texture.

It is pardonable to ask why one variety of wheat should be capable of produring a better loaf of bread than another. Unfortunately the reason is not obvious, and the differences that do exist are not easily measured. In the process of milling the outer skin and embryo of the grains are removed and go to form the by-products—bran and pollard. The central starchy portion is responsible for flour, and the chief constituents of this portion of the grain are starch, gluten and sugar. Of these three, the gluten is by far the most important from the point of view of quality. The gluten is the protein or nitrogenous element of the flour, and is present to the extent of usually about 10 per cent. Now quality, or strength, as it is often called, is intimately bound up with both the quantity and quality of the gluten present in the flour. In other words, the capacity of a certain flour to produce good, well-shaped, nice-textured loaves of bread is very largely dependent upon both the quantity and the quality of the gluten it contains. This is because the gluten is mainly responsible for the ability of the dough, made from the flour, to rise as a result of the production of carbon di-oxide during fermentation, and the ability also of the dough to hold this carbon di-oxide as it is formed and so maintain a puffed-up condition until it is properly baked.

To make good bread a dough must have good gas-producing properties, but at the same time it must have high gas-retentive powers. The gluten is actually responsible for the physical properties of the dough which give it the necessary elasticity and distensibility, combined with the power of gas retention.

Another important point is that the gluten of flour is responsible for its water-absorbing ability, and the water absorption of the flour in turn determines to a large extent the number of loaves that can be made from any given quantity.

All these points concern the gluten and its quality, but one other consideration concerning the value of flour is its diatatic activity which governs the rate of gas production by the yeast. The initial gassing power is dependent chiefly upon the sugar present in the flour. The latter aspect need not concern us greatly, except that it should be realised that some Australian wheats are considered too low in maltose.

It can be said that the chief consideration in measuring the baking quality of our wheats is to assess the quantity and quality of the gluten present, and because of its very important physical properties, its quality is of especial significance. This long definition of what determines quality in our wheat is necessary in order to understand the reasons for our present position, because, undoubtedly, the difficulty of measuring the relative qualities of samples has been the most serious handicap to the plant breeders of the past.

HOW THE PROBLEM ORIGINATED.

When two varieties of wheat are crossed in an attempt to breed a new variety, the heritable characteristics of both are intimately and completely intermingled, so that the grain obtained from the cross produces a plant bearing the characters of both parents. The many grains from this plant will produce plants entirely different, because the characteristics of the two original parents will be segregated into various and different combinations. Two years after the cross is made selection is possible from the plants so produced, but every plant is different, and must be kept separate and quite apart from others. Normally its potentialities for yield and its general agronomic characters can be judged to a reasonably accurate degree on appearances, but not so its quality.

In the past, it was necessary to proceed for several generations before sufficient grain from any particular selection was available to test for quality for the reason that no satisfactory method other than a baking test was known, and for this a millable quantity of grain was required. In short, this disability precluded the possibility of selection on scientific lines and, accompanied by a growing tendency of neglect quality and select for yield alone, led to the production of high-yielding strains with indifferent quality.

This latter development of the yield complex is quite understandable, and to make it clear, a retrospective glance over our wheat-breeding experience is helpful. When William Farrer commenced wheat breeding in Australia he paid special attention to quality, and in the earliest years of his work, selections were not encouraged or persevered with unless they possessed satisfactory quality. In fact, when the great pioneer variety, Federation, was selected and first grown in the breeding rows before it was named, it was considered to be rather too weak in flour strength, but its outstanding capacity to yield, combined with admirable agronomic characters, such as a strong straw and good grain-holding ability, outweighed the fact that it was hardly as good as Farrer required from a quality point of view. Federation, as is commonly known, revolutionised wheatgrowing in Australia, and made subsequent development possible and profitable.

Actually, its production also revolutionised the outlook, for from then on it appears that quality was given far less attention, due to the fact that wheats such as Federation were being feverishly sought after on the basis of their yieding ability alone. Yield became the primary consideration, and systematic selection on the part of the plant breeder was devoted to yield to the almost, if not entire, neglect of quality.

In substantiation of this argument one need only scan the pedigrees of the leading wheats of Australia. On the most recent figures available it was estimated that the 20 leading wheats in their approximate order are Nabawa, Ford, Free Gallipoli, Ranee, Waratah, Gluyas, Aussie, Currawa, Yandilla King, Gluclub, Federation, Ghurka, Bena, Bencubbin, Sepoy, Rajah, Noongar, Canberra, Turvey, and Penny.

All of these wheats, with the exception of Ford and Bena, are classed as weak, whilst several such as Free Gallipoli, Waratah, Gluyas, Currawa, Gluclub, Ghurka, and Noongar are very weak. Only in four of the 20 leading wheats, namely, Nabawa, Federation, Ford, and Bena, have parents with any pretensions to quality been used, and a measure of success has been obtained only with Ford and Bena. *Incidentally it might be mentioned that Ford was bred and released from Roseworthy Agricultural College.* The value of Ford has been recognised all over Australia and especially excellent reports have come from New South Wales, but seldom is due credit given to Roseworthy College for its creation; in fact its origin in most cases is left to inference which is not always fair.

The wheats which are causing most trouble, and likely to cause more, are in most cases of similar origin, and in the outstanding cases the trouble is traceable to a clubhead ancestor. Take Free Gallipoli, Currawa, Ghurka, and Gluclub. These few are certainy among the weakest quality wheats grown to any extent in Australia, and in all cases the clubhead type has been used in their breeding. Seek the motive behind the choice of the parents of such varieties as Free Gallipoli (Clubhead x Yandilla King) and Gluclub (Gluyas Early x Clubhead), and it is apparent that quality was given no consideration whatever.

From these remarks it should not be inferred that the policy of breeding for yield alone is the one explanation for the present position, nor that the policy is inexcusable. In fact, it was born in the early days by the success of high-yielding wheats like Federation, nurtured by the forgivable desire on the part of the farmer for increased monetary returns, and matured by the plant breeders who followed the dictates of demand. Moreover, it is possible that there is a linkage between the factors which contribute to high yield under our dry short-seasoned conditions and those which determine quality. If this is so, it will be necessary to handle large numbers of crossbred lines if an association of high quality with high yield is to be discovered.

THE EFFECTS OF MODERN DEVELOPMENT.

Until recent years there was absolutely no incentive to seek better quality wheats. Australian wheat was eagerly bought on the world's market, and in fact brought higher prices than the best Canadian. Our wheat has always been noted for its excellent colour, bloom, and dryness, and for the flavour it imparts to bread made from it. These characteristics, combined with its only very moderate quality, made it especially valuable for blending with the strong Manitoba wheat which in England is rarely used without being blended with weaker wheat. Fortunately, the other characteristics of our wheat made up for the deficiencies in the Manitoba, and, consequently was preferred to other wheats for the purpose of blending.

In recent years several factors have, however, altered the outlook, and one of the chief is that the universal use of bleaching by millers has reduced the significance of colour to a minimum, and thereby deprived Australian wheat of one of its former most valuable attributes. Hand in hand with this, the enormous increased production of soft European wheat has aggravated the position, and the demand for soft white wheats of the Australian type has accordingly decreased considerably.

Another factor is that mechanical mixing of dough has also been universally accepted and greater strength, or better quality, is necessary to stand up to the mixing so given. Flour from Australian wheats is often insufficiently strong to stand up to the modern methods of the bakehouse. The obvious reply is that Australian bakers make good bread from our wheats, but in answer again to this there are two items worth consideration. The first is that Australian wheat sold overseas is eventually used by bakers unaccustomed to baking from weak flour wheats, and unfortunately the task of making them change their ways in order to use more Australian wheat is out of the question. In other words, they are the customers and they have the right of stipulating what they want.

The second reason why our bakers succeed so well with Australian wheat is that they have first pick, and millers have developed keen selective methods, and undoubtedly buy for local requirements the best quality wheat that is grown here. This selection of all the best for home consumption naturally reduces quite considerably the quality of our f.a.q. wheat shipped overseas.

The change in outlook for Australian wheat brought about by the above-mentioned factors has been greatly exaggerated by the increased growth of wheats such as Free Gallipoli, Waratah, Gluclub, Ghurka, and other very weak wheats, the biggest proportion of which is exported, thereby tarnishing the name of Australian wheat. In fact, it appears that as a result of a complacent attitude, little by little the quality of our harvest has regressed. The regression has been most serious where the very weak varieties have dominated a State's harvest, and the spectacle of Victorian wheat not only bringing a lower price but being almost unsaleable is, undoubtedly, due to varietal influence rather than to those of environment.

IMPROVING THE QUALITY OF SOUTH AUSTRALIAN WHEAT.

1. The Exclusion of Very Weak Wheats.

Present indications are that our f.a.q. wheat must be improved in quality to the extent at least that the very weak flour wheats are excluded. The aim should be not to produce wheat of the strong flour class so much as to produce a sample of satisfactory strength to our customers.

The thing that must be checked immediately, and avoided in the future, is the indiscriminate and extensive growth of very weak flour wheats.

For nearly three years Roseworthy College has been face to face with the problem, and the work of improving the general quality standard of South Australian wheat has been one of major consideration. The College has openly condemned and ceased to distribute the seed of certain varieties, and in this regard the splendid response by farmers has been very commendable. The requests for seed of very weak flour varieties has diminished in spectacular fashion just as the demand for better quality wheats has increased, and one cannot help admiring, with a sense of pride, the loyalty of the farmer to the cause. It is certain that all the best farmers of the State will respond to any efforts which are being made, and might be made in the future, to curtail the growth of varieties of inferior quality.

2. Development of New Varieties.

The development of future varieties for cultivation in this State is chiefly the work of the Agricultural College at Roseworthy, and a brief outline of what is being done will indicate that the problem has not been neglected.

a. Testing of Existent Varieties.—New varieties from other States and countries are regularly introduced to the College and tested for yield and quality. To date, the two outstanding introductions are Dundee and Baringa, both of which show definite promise. The former possesses a baking quality of a higher order than any other widely grown Australian variety, and it combines this feature with desirable agronomic characters. Results at the College last season indicate that it is at least equal in yield to other leading varieties. It is being tested by farmers in many parts of the State, and reports so far have been encouraging.

Baringa undoubtedly possesses yielding ability, and was first in its class in the College Field Trials in 1934, and with the substantiation of these results in subsequent trials it will be recommended to farmers. Although the quality of this variety, in the true sense of the word, is only fair, it has certain characters, such as high stability of the dough and water absorbing capacity, which make it a valuable component of a blend, and millers in New South Wales are paying a slight premium for the wheat.

Other varieties of known high baking quality have been tested for yield, but results show them to be too deficient in this respect to warrant their cultivation. There are still some few varieties from other States which have yet to be tested, and it is possible that work in the future may reveal certain varieties which might well replace, in some districts at least, the poor quality varieties now being grown. Improvement in the general baking quality of South Australian wheat to be effected along these lines, is, however, necessarily restricted. The value of variety surveys is of an indirect nature in that they are likely to reveal suitable material for crossbreeding. For example, recent introductions from America and South Africa, although of no direct commercial value, combine high quality with disease resistance, and are being extensively used in the breeding work.

The cereal collection, which includes many hundreds of varieties, is under review, and all varieties possessing some desirable agronomic characters are being studied intensively or baking quality. Some of these varieties, particularly the older ones, which have never before been studied from this aspect, might possibly possess certain characters such as high gluten quality, stability, or high maltose content, which would make them valuable for cross-breeding purposes.

b. Selection for Quality Within Existent Carieties.—For the most part stability of varieties is an accepted thing, and in most cases where varieties have been in cultivation for several years following release from the plant breeder they breed true. There are exceptions to this rule, however, especially where the initial steps taken in the fixation of the variety have aimed at developing a type rather than a pure line, or where inordinate haste has dominated the breeder and the new strain is released before it is properly fixed. Examples are numerous, and in South Australia there are two of outstanding importance in Ford and Sword. These varieties exhibited appreciable variation in morphological characters which were readily detected by the naked eye. Accordingly it was both logical and sound to assume that similar variation existed in characters not so easily discerned, an important example being baking quality. This led to the initiation of strain selection in 1933, and the work has met with considerable success. Large numbers of single plants of these varieties were harvested and tested for quality by means of the Pelshenke Test, and it was found that there was a wide range in the quality of the individual plants, some of them giving a figure appreciably higher than that of the commercial sample. The remnant seed from the highest quality plants was sown in 1934, and further quality tests were carried out with the resultant grain from the 1934 harvest.

The quality figures for the individual lines so harvested, agreed closely with those of the parental single plants obtained from the previous year. The following figures substantiate this point:—

Selected Strains of Ford.—Pelshenke Figures for 1933 *and* 1934.

	1933.		1934	
Line.	Range.	Mean.	Range.	Mean.
Q	88-105	97	63-70	67
H1	90-128	108	77-78	77
T1	65-82	74	53-61	57
I1	34-72	62	40-68	52
F1	77-88	80	57-70	65
Y1	90-112	100	73-84	77

Over 40 lines of Ford are being grown at the College this season; these will yield sufficient grain for baking tests as well as yield trials. Up to the present it has not been possible to assess the actual difference in baking quality between the worst and the best of these lines—the Pelshenke figures range from 50 to 85—but as a result of the work, at least a slight improvement in the baking quality of this variety is highly probable. Gluten washing tests with the lines have revealed a considerable range in the gluten quantity, and no significant correlation between the Pelshenke figures and the gluten content of the lines exists; this indicates that inherent gluten quality is variable as well as the capacity of the line in producing quantity of gluten. Furthermore, it is possible that more detailed study of the various lines, which will be possible with up-to-date equipment, will detect significant differences in stability and diastatic activity. In this manner such tests may lead to the sorting out of strains which will result in improvement along these lines.

Sword, another variety showing variation, is more prolific than Ford in most parts of the State, but it lacks the disease resistance and baking quality of the latter. A pleasing feature of the work to date with Sword is that there are definite indications that a superior srain has already been isolated. For two years in succession this strain has given a Pelshenke figure equal to that of Ford, and the gluten washing test has shown that it possesses considerably more gluten, and a gluten of higher quality than that of the commercial Sword.

Of course, it may so happen that the superior quality strains produced by this method might be inferior in yield to the commercial varieties. Before a definite statement may be made in this respect another two years' trial will be necessary, but results obtained so far are hopeful.

The improvement of the baking quality of existent varieties is restricted to those varieties which have not been properly fixed, and which have some pretentions to satisfactory characters from the quality point of view. Beyond Sword and Ford, there are no varieties of significance to South Australia worthy of consideration. The economic importance of these two varieties, however, is sufficiently great that even a slight improvement in their baking quality should reflect favourably on the quality of South Australian f.a.q. wheat.

*c. **Breeding New Varieties.***—The breeding of new varieties of improved baking quality by cross-breeding is the method by which most progress will be accomplished.

A brief outline of the procedure adopted may help to elucidate the discussion which follows. The parents of each cross are first carefully selected. A combination is sought which will, theoretically, produce a wheat as nearly perfect as possible. There are a number of high quality wheats at the disposal of the plant breeder, but unfortunately too few of these are even fair agronomic types, and if insufficient consideration is given to the agronomic characters of both parents, success is very problematical. Most of the crosses at the College in the past three years have been made between such high quality wheats as Pusa 4, Dundee, S.H.J., Carrabin, Dindiloa, and others which possess some desirable characters, and the common low quality high yieding varieties, such as Sword, Ghurka, Gallipoli, Waratah, Nabawa, &c.

No selections are made until the second year, when a varying number of plants, according to the general appearance of the cross, are selected. These each give rise to a line in the third year, and every line possessing desirable agronomic characters is tested for quality by the Pelshenke test. If a line falls below a fixed standard of quality it is rejected. Seection for quality, yield, disease resistance, and so forth is continued to about the sixth generation, by which time the lines are sufficiently well fixed, and testing for yield on a field scale commences.

As already indicated, until quite recently the wheat breeder was seriously handicapped for the want of some measure of quality of small samples, but in 1930 a German worker published a paper outlining a whole meal fermentation test designed to guide the work of a plant breeder in sorting out wheat selections on a quality basis. This test, which is commonly known as the Pelshenke test, endeavours to measure both quantity and quality of gluten, combining the two in such a way as to express the comparative baking qualities of the wheat samples under review.

This test has been fully and carefully exploited at the College, and although it is not infallible, it is definitely a very useful and indispensable guide for the plant breeder. It is more a measure of quality of gluten than quantity, but using it and a gluten washing aparatus, both items can be independently measured with some degree of accuracy. The whole meal fermentation test enables the plant breeder to exclude with certainty the very weak quality wheats.

As a direct contrast to the older methods, the College has now adopted the procedure of harvesting large numbers of plants from the second generation populations, testing each plant for quality and rejecting all those which fall below the standards. This method is thus one of making sure of quality first and then looking for yield afterwards; theoretically, it is the method most likely to lead to success.

Between January and April this year some 8,000 single plants and lines were tested for quality at the College by the Pelshenke test, and it is safe to assume that a large majority of the single plants which have given a satisfactory Pelshenke figure will produce lines of satisfactory baking quality. Within two or three years the plant breeding plots at the College, which are now amongst the largest in Australia, will contain some thousands of crossbred lines of from fair to very good quality, and it is to be hoped that at least a few of these lines will possess yielding potentialities which will make them worthy of cultivation on a commercial scale.

The large majority of the populations of the two hundred odd crosses being grown at present are now in the second and third generation, and in this respect our work is as advanced as most in Australia, since it was not until 1932 that a determined move was made in any of the States towards the breeding of better quality wheats. Unfortunately, most of the crossbred material which was on hand before this time has been rejected on the score of poor baking quality, but some few lines, besides possessing desirable agronomic characters, have for two years in succession given satisfactory Pelshenke figures. These are now in advanced generations, and the time is ripe for submitting them to a baking test Indeed, after the current harvest there will be ample material ready for this test, and in subsequent harvests there should be hundreds of lines which will require testing.

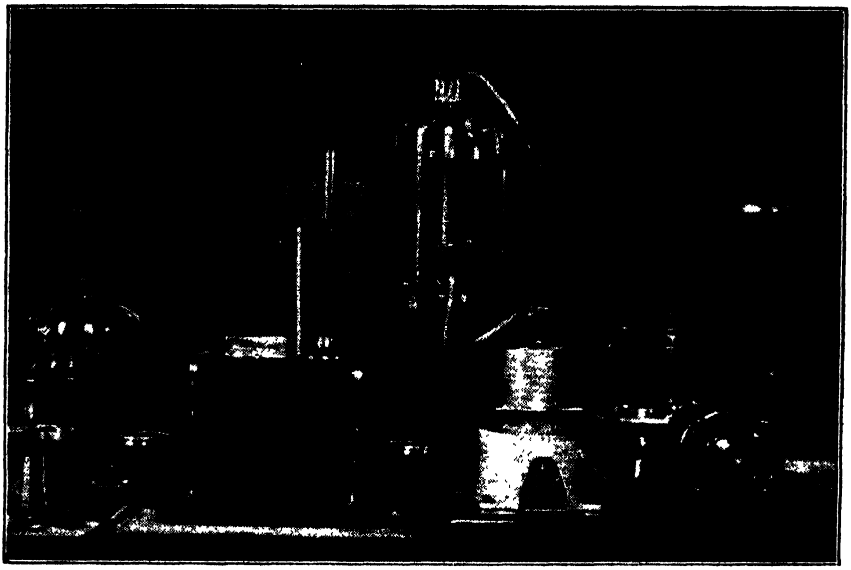
The need for handling large numbers of lines cannot be over-stressed. Experience in the past has shown that the combination of quality and yield is rare; consequently, the greater the number of lines studied the greater is the chance of isolating this desirable combination.

The College is fortunate in that it has as much typical wheat-growing land as is required for the work at its disposal, as well as a good supply of student labour, without which the expenses of the work would be very greatly increased. Given the indoor facilities in the way of modern apparatus, it will be in an unique position amongst the wheat-breeding stations in Australa, and the chances of producing the desired wheats will be greatly enhanced.

From the foregoing it will be seen that the programme of wheat improvement at Roseworthy College has already embodied the important principles of not allowing the good name of South Australia's wheat to be jeopardised in the future on the score of diminished quality. The objects are to check regression, to select and breed higher quality wheats, if possible, and in all cases to encourage and breed wheats which will be acceptable in quality, as in other characters, when treated as f.a.q. In this way no further retrogression should take place.

PROVISION OF THE NECESSARY EQUIPMENT.

While the Pelshenke test is both indispensable and satisfactory for early selective work, more critical tests are required when selected lines are in advanced generations. The gluten washing test is a handy supplement to the Pelshenke test, and the necessary equipment for the former was recently donated to the College by the Millers' Produce Company of South Australia Limited. The Rotor Gluten Washing Apparatus, generously presented, has already been of very great assistance. At present work on the standardisation of the test for our own requirements is being carried out, and in the future as many selected wheat lines as possible will be studied by this method.



Photograph of the Gluten Washing Apparatus presented to the College by the Millers Produce Coy. of South Australia Ltd.

The above actually defines the whole of the equipment at present in use at the College. It has been ample for the preliminary work of the improvement programme, and has accordingly sufficed to date. As the work advances, however, adequate equipment is essential to mill new strains of wheat, and to bake in an experimental way in order to test the merits or demerits of selected strains. Within the next year more substantial and conclusive tests will be necessary, involving baking tests. Sufficient grain of a number of new lines will be available after this harvest for such. This in itself is an admission that the baking of commercial loaves of bread from those new wheats gives the ultimate criterion of quality.

The equipment necessary to enable this to be done is costly, and, on being approached, the Millers' Produce Company of South Australia Limited, because of their interest and, it is felt, appreciation of the work being done at the College, have generously offered £100 towards this, and it is confidently anticipated that the Government will provide the remainder of the money required. Fundamentally, the sole aim is to do work of a practical nature to carry the plant breeding programme through to its logical end. In no way is it intended to seek elaborate equipment for cereal chemistry research; the latter presents problems the solution of which is the function of purely research institutions and organisations.

Negotiations are now in hand for the purchase of a small mill, proofing cabinet, and baking oven, together with supplementary apparatus, so that the College will be in a position to proceed independently with its work.

Baking tests permit only a few samples being done daily, so that only those lines which have proven agronomic characters, and which have given satisfactory Pelshenke and gluten figures, will be milled for baking. It is certain that, with the installation of the apparatus referred to, the College will be able to safeguard its policy of liberating for cultivation only those wheats which will be acceptable to the baker, and reflect credit on South Australian wheat generally.

To the Millers' Produce Company of South Australia Limited the College is deeply grateful, and appreciates the interest and generosity shown.

INCIDENTAL STUDIES.

a. Genetical.—Without losing sight of the economic aspect of the work, studies are being made on the inheritance of baking quality. The comprehension of the mode of inheritance of any particular character is of great importance to the plant breeder, but so far very little has been done, anywhere in the world, which will throw light on the mode of inheritance of baking quality. The method adopted at the College for the breeding of high quality wheats provides excellent material for such a study; observations to date have given some very interesting information.

Results indicate that the mode of inheritance is governed by the high quality parent used in the cross. In all crosses between Dundee and low quality wheats, only about 15 per cent. of the single plants from the second generation population gave a figure of 50 minutes or more while in crosses containing Pusa 4, 70 per cent. of the plants exceeded 50 minutes. Admittedly, the Pelshenke figure for Pusa 4 is higher than that for Dundee, but even so, the proportion of plants which gave a figure superior to the intermediate figure between those of the two parents was higher in all Pusa 4 crosses. This indicates, of course, that the possibility of recovering the parental quality is much greater in Pusa 4 than in Dundee crosses.

In certain crosses between two low quality wheats it was found that it is not unreasonable to expect the evolution of lines possessing at least moderate baking quality. Quite a large number of plants were discovered in such crosses, and notably in those containing Sword, which gave a figure much higher than the expectancy.

Work on the subject revealed that the kernel texture, in some crosses at least, is such a poor guide to baking quality that its use is not warranted. A large number of samples of grain which were hard and flinty gave a disappointingly low figure. Conversely, a number which were relatively soft and starchy gave a very satisfactory figure. This former phenomenon was most noticeable in the F3 lines of the cross Cadia x Sword. Cadia is a high quality wheat, with a hard vitreous kernel, and Sword possesses only fair quality and is soft kernelled.

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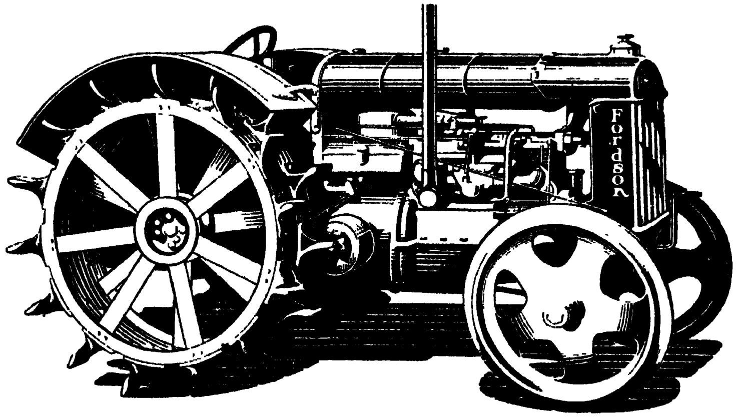

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The following are details of a few of the lines tested:—

Line.	Appearance of Grain.	Pelshenke Figure.
G1.	Similar to Sword	48
G2.	Hard and vitreous, plump	37
G3.	Hard and vitreous, plump	95
G9.	Medium soft, plump	33
G19.	Very hard and vitreous, normal	94
G21.	Hard and vitreous, plump	32

It will be seen from these figures that there is no association between high Pelshenke figures and flintiness of grain.

The effect of seasonal variation upon Pelshenke figures is considerable and it is necessary for the plant breeder to test each line for at least two years in succession before he can be certain that the quality of the line is inherent and not caused merely by seasonal conditions. This applies particularly to crosses containing certain wheats which have an abnormal tendency to fluctuate from season to season. Nabawa and Aussie are examples. In the cross Nabawa x Canberra the 1933 harvest yielded F4 lines which gave very good Pelshenke figures, but from the 1934 harvest the corresponding F5 lines, without exception, fell below the desired standard.

Nabawa x Canberra Crossbred Lines.

Line.	Pelshenke Figure.	
	1933.	1934.
G4.	70	26
G5.	70	27
G6.	70	30
G9.	73	33
G10.	73	34
G17.	52	28
G18.	52	27

On the other hand, results over two years from certain crosses illustrate that seasonal variation does not influence the Pelshenke figure a great deal when quality is inherent:—

Ford x Carrabin Crossbred Lines.

Line.	Pelshenke Figure.	
	1933.	1934.
G1.	85	120
G2.	85	130
G5.	56	65
G6.	56	56
G12.	52	55
G13.	52	49

Gluyas x Egyptian 4 Crossbred Lines.

Line.	Pelshenke Figure.	
	1933.	1934.
G2.	60	65
G3.	60	60
G12.	74	70
G13.	74	74
G22.	93	66
G23.	93	77

The determination of the relative merits of the various high quality parents commonly used and the mode of inheritance of baking quality in typical crosses should be of value to all Australian plant breeders in that the most expedient and economical method of handling any particular cross may be calculated.

b. Environmental.—In order to choose parents for cross-breeding, it is essential to assess as near as possible the relative quality values of many varieties. Unfortunately, the inherent quality of a parent may, to some extent, be disguised by variations induced by environment. The leading fact remains that baking quality is definitely a heritable character in wheat; on the other hand, it is known that environment, as controlled by soil and climate, has a potent influence on quality. It is also common knowledge that some millers make a practice of buying from certain districts, while others show a preference to certain varieties. This likewise indicates the uncertainty of opinions in the matter. One necessary adjunct to the work being done at the College, therefore, is to assess, if possible, the range of variability in the quality of wheat grown in different districts.

With this end in view, the College began a quality survey of the wheat lands of the State last season. Farmers in all centres volunteered to help, and nearly 500 undertook to sow samples. Ford wheat was used as the variety, the seed of one strain grown under identical conditions at the College being distributed to the farmers, who were asked to sow a sample within one of their crops and return the produce to the College for study. In spite of the adverse seeding conditions and the ravages of grasshoppers, nearly 350 samples of grain were returned.

As all the samples are progeny of the same single line of Ford grown at the College the year before, variations in appearance and quality may thus be attributed to environment. The majority of the grain samples consist of well-filled grain, but superficial differences in appearance are quite remarkable, showing every gradation from hard, vitreous grain to soft, opaque, mealy grain.

To date the samples have only been subjected to the Pelshenke test, and the range is from 35 to 100 minutes. It would be premature to make any definite statements yet, as further tests, which are being conducted by the Chemist (Mr. A. R. Hickinbotham), are necessary, and a detailed report will be published separately. It will be necessary, of course, to repeat the survey over another two or three seasons before any worth-while conclusions can be formulated.

There are indications, however, that although district is a major factor in determining quality, there are other important factors operating. Varietal influence is very important, for the Ford samples, in the main, gave satisfactory Pelshenke figures. There is a rough association between the figures and the districts, but some surprisingly good samples have been obtained from districts which reputedly produce only low quality grain, and some poor samples were grown in the so-called "high quality" districts. It appears that time of planting and finishing conditions, to name only two factors, might have a larger influence upon quality than is generally realised.

It is difficult to forecast the ultimate value of this experiment, but it is anticipated that gluten and maltose tests will do much to elucidate the position, and determine the nature of the factors affecting quality and give an idea of the area of South Australian wheat country from which it is reasonable to expect the production of grain of good baking quality.

Such a survey must ultimately be a guide to the future developmental work of the College in the fostering of new varieties.

c. Cereal Chemistry Problems.—The baking quality of wheat constitutes its ability to satisfy commercial baking requirements; the cereal chemist is asked to explain the connection between a good loaf of bread and the flour from which it was made, ultimately, of course, going back to the grain from which the flour was milled. In the process of deciphering such relationships, many abstruse problems present themselves, simply because quality is the expression of many attributes of the grain itself.

The cereal chemist, by conducting other tests in conjunction with baking tests, can for the most part correlate defects or qualities of the commercial loaf with contributory causes in the grain. He has at his disposal tests which include gluten determinations, water absorption, viscosity, colour, and gassing power, as well as baking tests, all of which will help in the final and accurate assessment of quality. Many problems arise out of standardisation of methods, and there is considerable room for research work into such matters. This, however, as already stated, is a matter for purely research institutions and organisations; in point of fact, it is a Commonwealth concern. Facilities for research in the way of funds and staff absolutely preclude it from the itinerary of programmes where practical plant breeding is the main consideration. Research work of this kind is, however, fundamental to progress, and when standardised clear-cut methods are available, then undoubtedly they will be welcomed and earnestly accepted for use in the selection and isolation of better quality wheats. The solution of cereal chemistry problems is of national importance, involving, as it does, milling and baking interests. In point of fact, view the matter in full perspective, and the usefulness of such research to the plant breeder takes a very subsidiary and secondary position.

It is not the intention of the College, therefore, to embark on any research of this character, except minor details which may arise incidental to the routine work involved in the testing of new strains of wheat.

SUPERPHOSPHATE AND PERENNIAL RYE GRASS FOR PASTURES.

The South Australian Committee of the Australian Dairy Council has decided to encourage the use of superphosphate for pastures by purchasing a quantity of that fertiliser for distribution among dairymen. The maximum quantity to be supplied will be 2½cwts. per milking cow, and the fertiliser must be used as a top dressing.

Applicants must state:—

1. District in which the farm is situated.
2. Number of cows milked.
3. Top dressing applied per acre in 1934 and 1935.
4. Class of pasture it is proposed to top dress.
5. If assisted, whether prepared to subsidise dressing on a pound for pound basis.

Applications will also be received from dairymen who propose planting a perennial rye grass pasture this season and who desire a free supply of seed. Applicants must be milking at least seven cows and must state:—

1. The area of land to be planted.
2. Class of soil.
3. Previous history of field.
4. Tillage given.
5. Pasture mixture and manure to be seeded.

Those who avail themselves of this service are to supply progress reports and to allow the Department to inspect the pastures.

Applications for both superphosphate and Perennial Rye Grass will be received not later than 12th May by the Hon. Secretary, South Australian Committee of the Australian Dairy Council, Box 901E, G.P.O., Adelaide.

RAISING EXPORT LAMBS ON SUBTERRANEAN CLOVER PASTURE LANDS.

[By L. J. COOK, R.D.A. (Manager, Kybybolite Experimental Farm.)]

The experiment commenced in 1933, testing the raising of export fat lambs on Subterranean Clover pastures at the Kybybolite Experimental Farm, was continued again in 1935.

Five flocks were used similarly as in 1934, consisting of 44 Comeback ewes each, selected as evenly as possible according to age, development and live weight. All ewes were full mouthed, and weighed 115lbs. on the average at mating on 7th February, 1935.

The same breed sires, namely Southdown, Suffolk, Dorset Horn, Ryeland and English Leicester were mated, and grazing method was adopted, similar to that of the previous seasons, *i.e.*, whilst being mated the flocks were grazed in fields of approximately equal area, and containing similar pasturage. After mating, all ewes were run together as one flock, and grazed under a rotational system on good fertilised clover pastures.

A week before lambing commenced, the flock was again divided into its sections, and each run on similar type of clover pasture during the lambing period. After marking, lambs and ewes were again run together as one flock.

During the whole period, neither ewes nor lambs were handfed, and they existed and grew entirely on grazing.

All lambs were sold off their mothers, and in the wool, and were grazed only on Subterranean Clover with its mixture of naturalised grasses, such as Barley and Brome Grasses.

The flocks were examined twice daily during lambing, and note of births taken.

Assistance was given to six ewes, two of which were in lamb to the Southdown ram, and one each in lamb to the other sires, making the total number of 12 assisted during the three seasons' lambing period. Of these 12, 4 ewes were in lamb to Suffolk ram, 3 to Southdown, 2 to Dorset Horn, 2 to Ryeland, and 1 to English Leicester.

Four ewes died this season at lambing time, making a total of six ewes for the three seasons. Amongst these ewes 2 were in lamb to Ryeland ram, 2 to Suffolk, and 1 each to Dorset Horn and English Leicester.

Five ewes died whilst suckling their lambs, which included 2 with Ryeland lambs, 2 with Dorset Horn and 1 with Southdown lambs, at foot.

The ewes this year were affected somewhat by foot trouble, which occurred right at the lambing period, and caused, besides the loss amongst ewes, an unevenness of quality of lambs produced.

The following table shows the number of lambs born, died, marked and marketed from each of the flocks in all seasons.

TABLE I.—*Lambing Results.*

Season.	Ewes Mated.	Ewes Failed to Breed.	Ewes Died.	Total Lambs Born.		Lambs Born Dead.	Lambs Died between Birth and Marking.	Lambs Marked.			Lambs Died between Marking and Marketing.	Lambs Marketed.	
		No.	No.	No.	Per cent.	No.	No.	No.	Per cent.		No.	No.	per cent.
1933	46 Comeback x Southdown	1	0	61	130·6	6	5	50	111·1	110·8	3	47	108·1
1934	44 Comeback x Southdown	20	0	34		0	5	29	120·8		0	29	
1935	44 Comeback x Southdown	2	0	50		2	4	44	104·8		0	44	
1933	46 Comeback x Dorset Horn.......	2	0	65	141·8	8	7	50	113·6	111·5	5	45	102·5
1934	44 Comeback x Dorset Horn.......	5	0	52		1	2	49	125·6		3	46	
1935	44 Comeback x Dorset Horn.......	4	1	56		4	15	37	94·9		3	34	
1933	46 Comeback x Suffolk	3	1	55	132·5	2	2	51	118·6	116·3	7	44	106·5
1934	44 Comeback x Suffolk	4	0	59		3	7	49	122·5		4	45	
1935	44 Comeback x Suffolk	3	0	49		0	6	43	104·9		1	42	
1933	46 Comeback x Eng. Leicester	2	1	64	134·8	3	7	54	122·7	107·8	3	51	104·3
1934	44 Comeback x Eng. Leicester	5	1	51		1	11	39	100·0		1	38	
1935	44 Comeback x Eng. Leicester	10	0	40		0	9	31	91·2		0	31	
1934	44 Comeback x Ryeland	11	0	47	137·5	2	4	41	124·2	108·3	2	39	102·8
1935	44 Comeback x Ryeland	5	0	52		3	12	37	94·9		2	35	
Totals—													
1933	184 Comeback ewes	8	2	245	140·8	19	21	205	116·5		18	187	106·2
1934	220 Comeback ewes	45	1	243	139·7	7	29	207	118·3		10	197	112·6
1935	220 Comeback ewes	24	1	247	126·7	9	46	192	98·5		6	186	95·4
Three yrs.	624 Comeback ewes	77	4	735	135·4	35	96	604	111·2		34	570	105·0

Percentages quoted in above Table show per cent. of lambs to the number of ewes that bred.

The percentage of lambs marketed to number of ewes mated has been 91 per cent.

In the first column of Table I., it is to be noted that 24 ewes failed to breed this season, which is better than the previous season, when 45 ewes did not breed. This factor is probably due to the individuality of the ram used, only one ram being used in each flock. The English Leicester ram failed more than others this season, having 10 dry ewes in his flock out of the total of 24. There were 5 in the Ryeland flock; 4 in the Dorset Horn; 3 in the Suffolk; and 2 in the Southdown flock. For the three years, 23 failed to breed to the Southdown ram; 17 to English Leicester; 16 to Ryeland; and only 11 and 10 to the Dorset Horn and Suffolk respectively.

Column 2 shows that the loss of ewes before lambing has been very slight, only 4 from amongst 624 ewes in the three seasons.

Column 3 shows that the Dorset Horn cross with 56 lambs born, was the most prolific for this season, followed closely by the Ryeland cross with 52 and the Southdown cross with 50 lambs. The total lambs born—127 per cent. for the season—is the lowest for the three years, being 13 per cent. to 14 per cent. less than the previous two seasons, and reduces the average for the three year period to 135 per cent. For the full period, the Dorset Horn cross leads with 142 per cent. of births, the Ryeland cross is second with 137 per cent., and the Southdown cross lowest with 130 per cent.

Column 4 shows the number of lambs born dead, a total of 9 for this season which is below the average. The Dorset Horn cross with 4, and the Ryeland cross with 3, were the main losses at birth. The former has had 13 lambs born dead out of a total of 35 for the three seasons, showing that, although this cross has had the greatest number of births, it has been discounted by the larger number of lambs born dead, and those that died before marking.

Column 5 which shows the number of lamb deaths between birth and marking, discloses 15 deaths against the Dorset Horn cross out of a total of 46; 12 against the Ryeland cross; 9 against the English Leicester; and only 6 and 4 against the Suffolk and Southdown crosses. The total of 46 deaths was more than usual, and was no doubt due to the poorer condition of the ewes. The Suffolk and Southdown cross lambs—appear from this column—to have been the strongest on the average throughout the three seasons.

The next column reveals that the total percentage of 98.5 lambs marked from all crosses for 1935, is considerably less than usual, and has reduced the average to 111 per cent. for the three seasons. The Suffolk and Southdown crosses marked the most with approximately 105 per cent. each, although for the three seasons the Suffolk cross with 116 per cent. average is 5 per cent. better than the Dorset Horn, and Southdown crosses with 111½ per cent. and 111 per cent. respectively.

Only six lambs died between marking and marketing this season, which is less than usual. Of the six deaths, four were some of the best grown lambs of the Dorset Horn and Suffolk crosses, and were due apparently to "Enterotoxaemia."

The final column shows the number of each cross marketed each season, and the average percentage for the three seasons. This season 12 of the ewe lambs amongst the Comeback x English Leicester were not sold, but kept on the farm for special future work. Their live weights, however, were taken on the farm, and they were allowed average returns in compiling Tables Nos. 6 and 7 in this article. For the three seasons, 105 per cent. of lambs from ewes that bred were marketed, whilst 91 per cent. of lambs from ewes mated were marketed. The Southdown cross has marketed the greatest percentage with 108; Suffolk cross second with 106½ per cent.; English Leicester cross 104 per cent.; and the Ryeland and Dorset Horn crosses 102 per cent.

This season's lambs were marketed in two consignments, the first on 18th November (17 to 18 weeks of age), and the second on 10th December (20 to 21 weeks of age).

WEIGHT OF LAMBS.

Lambs were weighed individually on the farm before consignment, and the cold dressed weights have been provided by the Portland Freezing Works.

Table II. shows the average live and dressed weights of each cross in the six consignments forwarded during the past three seasons, with the percentages of dressed to live weight.

TABLE II.—*Weight of Lambs.*

Season.	Breed.		Live Weight at the Farm. Lbs.		Dressed Weight at Portland. Lbs.		Per cent.	
1933 ...	28 Comeback x Southdown	113.......	72·8	69·3	31·7	29·8	43·5	43·0
	17 Comeback x Southdown		75·3		32·2		42·7	
1934 ...	8 Comeback x Southdown		66·6		31·5		47·3	
	19 Comeback x Southdown		69·8		28·5		40·8	
1935 ...	18 Comeback x Southdown		68·1		30·1		44·1	
	23 Comeback x Southdown		62·3		25·9		41·6	
1933 ...	29 Comeback x Dorset Horn	120.......	75·3	76·0	30·7	32·0	40·9	42·1
	13 Comeback x Dorset Horn		90·2		37·1		41·1	
1934 ...	33 Comeback x Dorset Horn		73·1		32·8		44·8	
	11 Comeback x Dorset Horn		74·5		27·4		36·8	
1935 ...	32 Comeback x Dorset Horn		75·2		32·1		42·6	
	2 Comeback x Dorset Horn		65·0		28·5		43·8	
1933 ...	33 Comeback x Suffolk	127...........	75·1	74·8	30·7	31·3	40·9	41·8
	9 Comeback x Suffolk		81·9		33·2		40·6	
1934 ...	26 Comeback x Suffolk		73·0		33·1		45·3	
	17 Comeback x Suffolk		77·4		28·0		36·2	
1935 ...	34 Comeback x Suffolk		75·0		32·4		43·2	
	8 Comeback x Suffolk		65·3		27·6		42·3	
1933 ...	26 Comeback x English Leicester	104...	70·5	74·5	28·5	30·1	40·4	40·4
	22 Comeback x English Leicester		83·5		32·9		39·5	
1934 ...	16 Comeback x English Leicester		68·4		30·9		45·1	
	21 Comeback x English Leicester		79·7		29·8		37·4	
1935 ...	12 Comeback x English Leicester		72·5		30·5		42·1	
	7 Comeback x English Leicester		62·9		25·0		39·7	
1934 ...	18 Comeback x Ryeland	70...........	70·5	71·9	31·9	29·4	45·2	40·9
	19 Comeback x Ryeland		74·3		26·6		35·8	
1935 ...	24 Comeback x Ryeland		73·0		30·7		42·1	
	9 Comeback x Ryeland		66·9		26·9		40·2	
	Average all Crosses—							
1933 ...	116 1st Consignment	534.............	73·5	73·5	30·5	30·6	41·4	41·6
	61 2nd Consignment		82·4		33·7		40·9	
1934 ...	101 1st Consignment		71·3		32·3		45·3	
	87 2nd Consignment		75·2		28·2		37·5	
1935 ...	120 1st Consignment		73·4		31·4		42·8	
	49 2nd Consignment		63·8		26·3		41·2	

The lambs did not develop as well as in the previous two seasons, and a fair proportion of the second consignment was light in weight. The first consignment averaged 73.4lbs. live weight and 31.4lbs. dressed, which shows a percentage dressed weight of 42.8 per cent., which is slightly better than the average of 41.6 per cent. for the three seasons. The second consignment averaged 63.8lbs. live, and 26.3lbs. dressed weight, a percentage dressed weight of 41.2, just a little less than the average.

Of the different crosses, practically little variation between the percentages of dressed to live weight occurred this season, between the Southdown, Suffolk and Dorset Horn crosses, but the Ryeland and English Leicester crosses were 1 to 1½ per cent. lower.

For the whole six consignments, the Southdown cross leads with 43 per cent. dressed to live weight, the Dorset Horn cross is second with 42.1 per cent., the Suffolk cross is third with 41.8 per cent., all three above the average of 41.6 per cent., whilst the Ryeland and English Leicester crosses were a little below average with 40.9 per cent. and 40.4 per cent. respectively. The whole 534 lambs averaged 73.5lbs. live weight when removed from their mothers, and dressed 30.6lbs. on the hooks; a very good weight for export purposes. The Dorset Horn cross produced the heaviest lambs; 76lbs. on the average and dressed 32lbs. The Suffolk and English Leicester crosses were 1lb. and 1½lbs. lighter in live weight, and dressed 31.3lbs. and 30.1lbs. respectively. The Southdown cross gave the lightest lambs, 69.3lbs. live weight, but dressed well with 29.8lbs. average. The Ryeland cross averaged 71.9lbs. live weight, and 29.4lbs. dressed.

QUALITY OF LAMBS.

Regarding the quality of the lambs for export, the following Table shows the number and percentages of carcasses of each cross in each consignment, placed in grades by the purchasers (Messrs. Borthwick Ltd.).

TABLE III.—*Quality of Lambs.*

Season.	Breed.	First Quality.		Second Quality.		Third Quality.		Rejects.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
1933	28 Cmbk. x Southdown	28		—		—		1	
	17 Cmbk. x Southdown	14		2		—		—	
1934	8 Cmbk. x Southdown	8		—		—		—	
	19 Cmbk. x Southdown	14		5		—		—	
1935	18 Cmbk. x Southdown	14		4		—		—	
	23 Cmbk. x Southdown	14		9		—		—	
	113	92	81·4	20	17·7	—		1	0·9
1933	29 Cmbk x Dorset Horn	18		11		—		—	
	13 Cmbk. x Dorset Horn	10		3		—		—	
1934	33 Cmbk. x Dorset Horn	29		4		—		—	
	11 Cmbk. x Dorset Horn	4		5		2		—	
1935	32 Cmbk. x Dorset Horn	19		12		1		—	
	2 Cmbk. x Dorset Horn	1		1		—		—	
	120	81	67·5	36	30·0	3	2·5	—	
1933	33 Cmbk. x Suffolk ...	18		13		2		—	
	9 Cmbk. x Suffolk ...	3		4		1		1	
1934	26 Cmbk. x Suffolk ...	20		6		—		—	
	17 Cmbk. x Suffolk ...	5		9		3		—	
1935	34 Cmbk. x Suffolk ...	11		22		1		—	
	8 Cmbk. x Suffolk ...	1		5		1		1	
	127	58	45·7	59	46·4	8	6·3	2	1·6
1933	26 Cmbk. x Eng. Leictr	12		10		2		2	
	22 Cmbk. x Engl Leictr	18		4		—		—	
1934	16 Cmbk. x Eng. Leictr	11		4		1		—	
	21 Cmbk. x Eng. Leictr	9		12		—		—	
1935	12 Cmbk. x Eng. Leictr	4		8		—		—	
	7 Cmbk. x Eng. Leictr	2		5		—		—	
	104	56	53·8	43	41·4	3	2·9	2	1·9
1934	18 Cmbk. x Ryeland ..	16		2		—		—	
	19 Cmbk x Ryeland ..	6		8		5		—	
1935	24 Cmbk. x Ryeland ..	11		12		1		—	
	9 Cmbk. x Ryeland ..	5		4		—		—	
	70	38	54·3	26	37·1	6	8·6	—	
	Total all crosses 534 lambs	325	60·9	184	34·5	20	3·7	5	0·9

This Table shows that of the 534 lambs, 325 were classed as first quality, 184 as second quality, 20 as third quality and 5 were rejected.

This result is satisfactory when it is remembered that every lamb reared in the flocks was sent to the freezers, except 5 lambs whose dams died shortly after birth, and 12 Comeback x English Leicester ewe lambs, that have been kept back on the farm this season for future breeding purposes.

The outstanding fact is the excellent quality of lambs produced by the Southdown cross; 92 lambs (81.4 per cent.) out of 113 of this cross were first quality, whereas the average of all crosses was only 60.9 per cent. first quality.

These Southdown cross lambs produced very fine, shapely carcasses of prime quality, comparatively even in weight. In live weight this season there was a variation of 26lbs. between the lightest and heaviest lambs, but 66 per cent. of the lambs weighed within 3lbs. of the average for all of the cross. The Comeback x Dorset Horn lambs ranked second in quality with 67.5 per cent. first quality, 30 per cent. second quality, and only 2.5 per cent. third quality. They were a fine, prime lot, growing and maturing quickly, but lacking in conformation. Also, there was a greater variation in the live weights, only 35 per cent. of the lambs this season weighing within 3lbs. of the average for the cross, and there was a difference of 33lbs. between the lightest and heaviest lambs.

The Comeback x Ryeland lambs produced 54.3 per cent. first quality, 37.1 per cent. second quality, and 8.6 per cent. third quality. The tops of this cross were very fine prime lambs, almost equal to the Southdown cross. The weights, however, varied more, and although like the Southdown cross there were only 25lbs. difference between the heaviest and lightest lamb, only 45 per cent. of the lambs weighed within 3lbs. of the average for the cross.

For shape and conformation the Comeback x English Leicester lambs were good, and were not greatly inferior to the Southdown. They were, however, slower in maturing, and did not thrive as well as other crosses; 52.8 per cent. of their carcasses were classed as first quality, and in evenness of weight and development they ranked next to the Southdown cross, 53 per cent. of their lambs weighing within 3lbs. of the average for the cross.

The Suffolk cross lambs continue to show to least advantage as regards quality. They were very strong, quick growing lambs, but lacking conformation. They also showed a lot of variation in development, 45 per cent. of these lambs weighed within 3lbs. of their average live weight, but there was a difference of 46lbs. between the lightest and heaviest lambs.

VALUE OF THE LAMBS.

The lambs were again sold on the hooks at Portland, and Table IV. gives the details of returns for the various crosses for this season.

Similar details for lambs sold in 1933 were published in volume 37, pages 1238-1240, South Australian *Journal of Agriculture,* and for those sold in 1934, in volume 39, page 42 of the same journal.

TABLE IV.—*Lamb Values and Returns*, 1935.

No. and Breed.	Lamb. Lbs. Price.	Value.	Value per Carcass.		Skin Value.	Charges.	Net Value of Lamb.	
	d.	£ s. d.	s. d.		s. d.	s. d.	s. d.	
Comeback x Southdown—								
1st Consignment—								
14 carcasses	430 at 6$\frac{5}{16}$	11 6 2	16 1¾	15 5	3 10	1 9¼	17 5¾	16 2½
4 carcasses	111 at 5$\frac{9}{16}$	2 11 5	12 10¼					
2nd Consignment—								
14 carcasses	375 at 6$\frac{5}{16}$	9 17 3	14 1	13 0¼	3 10	1 7¾	15 2½	
9 carcasses	221 at 5$\frac{9}{16}$	5 2 5	11 4½					
Comeback x Dorset Horn—								
1st Consignment—								
16 carcasses	523 at 6$\frac{5}{16}$	13 15 1	17 2¼	16 0½	3 10	1 9¼	18 1¼	17 11¾
3 carcasses	115 at 6$\frac{3}{16}$	2 19 4	19 9¼					
12 carcasses	361 at 5$\frac{9}{16}$	8 7 4	13 11¼					
1 carcass	27 at 5¼	0 11 10	11 10					
2nd consignment—								
1 carcass	30 at 6$\frac{5}{16}$	0 15 9½	15 9½	14 1¾	3 7	1 7¾	16 1	
1 carcass	27 at 5$\frac{9}{16}$	0 12 6¼	12 6¼					
Comeback x Suffolk—								
1st consignment—								
8 carcasses	258 at 6$\frac{5}{16}$	6 15 9	16 11¾	15 7	3 8	1 9¼	17 5¾	16 10
2 carcasses	76 at 6$\frac{3}{16}$	1 19 2	19 7					
1 carcass	48 at 6$\frac{1}{16}$	1 4 3	24 3					
22 carcasses	688 at 5$\frac{9}{16}$	15 18 11	14 6					
1 carcass	27 at 5¼	0 11 10	11 10					
2nd consignment—								
1 carcass	29 at 6$\frac{5}{16}$	0 15 3	15 3	12 0¼	3 8	1 7¾	14 0½	
5 carcasses	140 at 5$\frac{9}{16}$	3 4 10¾	12 11¾					
1 carcass	24 at 5⅛	0 10 3	10 3					
1 carcass	20 at 3½	0 5 10	5 10					

TABLE IV.—*Lamb Values and Returns*, 1935.—continued.

No. and Breed.	Lamb. Lbs. Price.	Value.	Value per Carcass.		Skin Value.	Charges.	Net Value of Lamb.	
	d.	£ s. d.	s. d.		s. d.	s. d.	s. d.	
Comeback x English Leicester—								
1st Consignment—								
3 carcasses	99 at 6 5/16	2 12 1	17 4¼	14 9¾	3 11	1 9¼	16 11½	15 11
1 carcass	37 at 6 3/16	0 19 1	19 1					
8 carcasses	230 at 5 9/16	5 6 7	13 3¾					
2nd Consignment—								
2 carcasses	56 at 6 5/16	1 9 5½	14 8¾	12 1	3 8	1 7¾	14 1¼	
5 carcasses	119 at 5 9/16	2 15 2	11 0½					
Comeback x Ryeland—								
1st Consignment—								
10 carcasses	320 at 6 5/16	8 8 4	16 10	15 1½	4 0	1 9¼	17 4¼	16 10½
1 carcass	38 at 6 3/16	0 19 7	19 7					
12 carcasses	352 at 5 9/16	8 3 2	13 7¼					
1 carcass	27 at 5¼	0 11 10	11 10					
2nd Consignment—								
5 carcasses	138 at 6 5/16	3 12 7	14 6¼	13 5	3 10	1 7¾	15 7¼	
4 carcasses	104 at 5 9/16	2 8 2¼	12 0½					
Total all crosses—								
1st Consignment—								
51 carcasses	1,630 at 6 5/16	42 17 5	16 9¾	15 6¼	3 9¾	1 9¼	17 6¾	16 9¾
7 carcasses	266 at 6 3/16	6 17 2	19 7¼					
1 carcass	48 at 6 1/16	1 4 3	24 3					
58 carcasses	1,742 at 5 9/16	40 7 5	13 11					
3 carcasses	81 at 5¼	1 15 6	11 10					
2nd Consignment—								
23 carcasses	628 at 6 5/16	16 10 4¼	14 4¼	12 10¼	3 9¼	1 7¾	14 11¾	
24 carcasses	611 at 5 9/16	14 3 2¾	11 9½					
1 carcass	24 at 5¼	0 10 3	10 3					
1 carcass	20 at 3½	0 5 10	5 10					

The prices in the final column indicate the net price per head for each cross received at Kybybolite, after paying freight and charges, and shows that the Comeback x Dorset Horn lambs returned the best price, namely 17s. 11¾d. per head, 1s. 1¼d. better than the Ryeland cross, which realised 16s. 10½d., and 1s. 1¾d. better than the Suffolk cross which realised 16s. 10d. each. The Southdown cross realised 16s. 2½d. each, and the English Leicester cross 15s. 11d.

The average price received for the whole of first consignment, which comprised the choicest of the lambs, was 17s. 6¾d. each, and that for the second consignment or later lambs was 14s. 11¾d., an average for the season's lambs of 16s. 9¾d. Amongst the first consignment, the Dorset Horn cross realised 18s. 1¼d. per head, the Southdown, and Suffolk crosses 17s. 5¾d., the Ryeland cross 17s. 4¼d., and the English Leicester cross 16s. 11½d.

The price received for lamb this season was 6 5/16th pence per lb. for first quality, which was 3/16th penny higher than price paid in 1934, whilst the price received for second quality lamb was 5 9/16th pence; ¼d. per lb. less than that paid in 1934.

The skin values were higher this season, and varied a little more than the previous year. The Ryeland cross averaged 3s. 11d. per skin, the Southdown cross 3s. 10d., English Leicester cross 3s. 9½d., Dorset Horn cross 3s. 8½d. and the Suffolk cross 3s. 8d.

The charges include 1s. 1d. freight from Kybybolite to Portland—an approximate distance of 150 miles—and selling commission.

In the next Table the prices received in 1933 and 1934 have been included with those of 1935, and the average price of each quality lamb has been computed for the three seasons.

TABLE V.—*Value of Lambs at Kybybolite*, 1933-35.

No.	Quality.	Breed.	Price per Lamb.			
			s.	*d.*	*s.*	*d.*
92	First	Comeback x Southdown	16	3¼	15	6¼
20	Second	Comeback x Southdown	13	8¼		
4	Rejects	Comeback x Southdown	7	10		
81	First	Comeback x Dorset Horn	17	6	16	3
36	Second	Comeback x Dorset Horn	13	10¼		
3	Third	Comeback x Dorset Horn	11	1½		
58	First	Comeback x Suffolk	17	1¼	15	4
59	Second	Comeback x Suffolk	14	5		
8	Third	Comeback x Suffolk	11	1		
2	Rejects	Comeback x Suffolk	8	5		
56	First	Comeback x English Leicester	17	0½	14	11¼
43	Second	Comeback x English Leciester	13	0		
3	Third	Comeback x English Leicester	9	10¼		
2	Rejects	Comeback x English Leicester	5	5¼		
38	First	Comeback x Ryeland	17	3¾	15	3
26	Second	Comeback x Ryeland	14	2¼		
6	Third	Comeback x Ryeland	9	6		
2	Rejects	Comeback x Ryeland	7	0¾		
		Average value of all lambs, 1933	15	1½		
		Average value of all lambs, 1934	14	10½		
		Average value of all lambs, 1935	16	9¾		
		Mean average value of all lambs, 1933-35	15	6		

These figures show that the whole of the lambs sent to the freezers realised 15s. 1½d. per head at Kybybolite in 1933, 14s. 10½d. in 1934, and 16s. 9¾d. in 1935, or a mean average of 15s. 6d. per head for the three seasons. The Dorset Horn cross has been the most valuable at 16s. 3d. per head, the Southdown cross has averaged 15s. 6¼d., the Suffolk cross 15s. 4d., Ryeland cross 15s. 3d., and the English Leicester cross 14s. 11¼d. These differences are appreciable, and show that the weighty Dorset Horn cross lambs—although they lacked in quality—realised approximately 9d. per head better than any other cross.

RETURN OF LAMB VALUE PER EWE THAT BRED.

The next Table compares the return per ewe from each flock, and to obviate the effect of single ram mating, the dry ewes have not been counted.

TABLE VI.—*Return of Lamb Value per Ewe that Bred.*

	Value per Ewe.	
	s.	*d.*
111 Comeback ewes mated to Southdown ram produced 120 marketed lambs..	16	8¼
123 Comeback ewes mated to Dorset Horn ram produced 125 marketed lambs..	16	6¼
124 Comeback ewes mated to Suffolk ram produced 131 marketed lambs	16	2½
117 Comeback ewes mated to English Leicester ram produced 120 marketed lambs	15	3¾
72 Comeback ewes mated to Ryeland ram produced 74 marketed lambs	15	8

This Table shows that the ewes mated to Southdown ram have returned 16s. 8¼d. each, 2d. more than the ewes mated to Dorset Horn ram, and 6d. more than those mated to the Suffolk ram, whilst those mated to Ryeland and English Leicester rams, have returned 15s. 8d. and 15s. 3¾d. each, or 1s. and 1s. 4½d. per ewe less than the Southdown cross.

These figures, however, do not take into account the question of early or late maturity of lambs, and as this varied with the different breeds, an allowance for grazing can be deducted, which would then give a better comparative value.

Table VII. shows deductions from the returns from each cross, allowing grazing of lambs at 2d. per week per head.

TABLE VII.—*Return Per Ewe Less Lamb Grazing Cost.*

Comeback x Southdown returned 16s. 8¼d per ewe
less 30 lambs for 12 weeks at 2s. 0d. each
less 17 lambs for 24 weeks at 4s. 0d. each
less 10 lambs for 13 weeks at 2s. 2d. each
less 19 lambs for 20 weeks at 3s. 4d. each
less 18 lambs for 16 weeks at 2s. 8d. each
less 26 lambs for 19 weeks at 3s. 2d. each
2s. 10¼d. equals 13s. 10d. per ewe.

Comeback x Dorset Horn returned 16s. 6¼d. per ewe
less 32 lambs for 12 weeks at 2s. 0d. each
less 13 lambs for 24 weeks at 4s. 0d. each
less 35 lambs for 13 weeks at 2s. 2d. each
less 11 lambs for 20 weeks at 3s. 4d. each
less 32 lambs for 16 weeks at 2s. 8d. each
less 2 lambs for 19 weeks at 3s. 2d. each
2s. 6¾d. equals 13s. 11½d. per ewe.

TABLE VII.—*Return Per Ewe Less Lamb Grazing Cost*—continued.

Comeback x Suffolk returned 16s. 2½d. per ewe.
less 35 lambs for 12 weeks at 2s. 0d. each
less 9 lambs for 24 weeks at 4s. 0d. each
less 28 lambs for 13 weeks at 2s. 2d. each
less 17 lambs for 20 weeks at 3s. 4d. each
less 34 lambs for 16 weeks at 2s. 8d. each
less 8 lambs for 19 weeks at 3s. 2d. each
2s. 7d. equals 13s. 7½d. per ewe.

Comeback x Leicester returned 15s. 3¾d. per ewe.
less 29 lambs for 12 weeks at 2s. 0d. each
less 22 lambs for 24 weeks at 4s. 0d. each
less 17 lambs for 13 weeks at 2s. 2d. each
less 21 lambs for 20 weeks at 3s. 4d. each
less 19 lambs for 16 weeks at 2s. 8d. each
less 12 lambs for 19 weeks at 3s. 2d. each
2s. 10¼d. equals 12s. 5½d. per ewe.

Comeback x Ryeland returned 15s. 8d. per ewe.
less 20 lambs for 13 weeks at 2s. 2d. each
less 19 lambs for 20 weeks at 3s. 4d. each
less 24 lambs for 16 weeks at 2s. 8d. each
less 11 lambs for 19 weeks at 3s. 2d. each
2s. 9¼d. equals 12s. 10¾d. per ewe.

With these allowances made, it is seen that the ewes mated to the Dorset Horn ram show an increase return of 1½d. per ewe above those mated to Southdown ram, and 4d. per ewe above those mated to Suffolk ram. Those mated to Ryeland and English Leicester rams have returned 1s. and 1s. 6d. per head less.

This report now shows the results of three seasons' work, and definitely proves that export fat lambs can be satisfactorily bred and developed on well fertilised Subterranean Clover pasture. It is also apparent that the Comeback ewe—which gives away very little in wool to the Merino—is quite a suitable dam for breeding these lambs. The results at present show that certain English Breed Sires are more productive than others, but it is necessary to repeat the trials for a few more seasons before arriving at a definite conclusion on the point.

The fields used for grazing the flocks in this experiment, contain principally Subterranean Clover and annual grasses such as Barley and Brome grasses. They receive 1cwt. 45 per cent. superphosphate annually, and this season have carried 4.42 sheep per acre under our modified system of rotational grazing.

THE NEED FOR DIVERSIFICATION IN FARMING THE LANDS OF THE BETTER RAINFALL AREAS IN SOUTH AUSTRALIA.

[R. HILL, Agricultural Instructor for Central District.]

As in all new countries, the early settlers in South Australia based the methods of farming on experience gained in their homeland, but the many differences due to climate, soil types, and access to markets for their produce forced adaptation to the altered conditions.

Their sound judgment in selecting the best land is evidenced by the localities chosen by the early landholders, but a century of experience has produced many changes in agricultural practices, which are still governed to some degree by the ability to market produce economically.

Science has played a big part in overcoming many difficulties in production and marketing, but the individual farmer still has many problems to face in obtaining maximum returns from his holding.

Various methods of working farms have been adopted, but definite changes have taken place in general agricultural practice.

Wheat crops for grain are no longer grown in any quantity on the Bald Hills at Mount Barker Springs where the Frame family once made history with such crops, nor are they grown in many other high rainfall districts where, under present conditions, the land can be utilised to greater advantage.

Later still, cereal crops for hay were replaced to a great extent by meadow hay, a change brought about principally by the untiring efforts of the late Mr. Howard, of Blakiston, in introducing Subterranean Clover seed commercially, followed by the practice of applying superphosphate to pasture lands.

Subterranean Clover and superphosphate have been the outstanding factors in pioneering a complete change in the farming practices in the heavy rainfall districts.

These two factors have, by raising the nitrogen level and improving the general physical condition of soils, made it possible to utilise land otherwise considered useless, and have paved the way for the introduction of a more diversified type of farming. What a change has taken place—even during the last decade—and how wonderful the possibilities of developing so much of the idle land in the high rainfall areas with the experience gained in recent years!

Potato crops are now being grown following Subterranean Clover on land very much despised only a few years ago, the establishing of better pastures, including their management, has improved, but there is still much to learn.

Those people interested in the development of pastures must realise that their work is not completed when Subterranean Clover pastures are established, and that, with the raising of the nitrogen level of soils, other permanent pasture plants must be introduced, coupled with the subdivision of holdings into small fields in order to afford facilities for satisfactory management.

As in the low rainfall districts, the high rainfall areas have a lean period which must be provided for by the conservation of fodders consisting of hay and ensilage in spring and the growing of fodder crops principally during summer.

All these things are possible, and surely the changed conditions provide an opportunity, and what is more, the necessity for diversification in farming practices on land already developed, and large areas still in a virgin state.

Throughout the area in question, the carrying capacity of land has been considerably increased, and there is a tendency to reduce the area of the larger holdings in order to develop a more intense type of farming. This is a sign of progress which presents an opportunity for closer settlement, increased population, and more economic production.

Although rarely seen on small holdings a few years ago, sheep are proving themselves to be important revenue-earners to-day, and the fat lamb industry has been consolidated because of their presence in the sure rainfall districts.

Where only dairy cows and pigs were carried on holdings a few years ago, to-day beef cattle and sheep are recognised as necessary additions to the livestock population where maximum returns and economic grazing of improved pastures are considered. Permanent pastures need renewing from time to time when cultivated crops, including potatoes, may be grown to advantage and the fields improved in condition for new pastures which are to follow.

In this, the centenary year of the State, thoughts are more than ever diverted to the pioneers of many years ago, who blazed the trail in establishing agriculture in South Australia. They arrived in a new country, some with previous agricultural experience, but all had much to learn in the new environment. Undoubtedly many mistakes were made, but their wisdom in recognising the potential value of lands in assured rainfall districts was a gift of foresight, unfortunately not inherited by later generations.

SOUTH AUSTRALIAN COMMITTEE OF AUSTRALIAN DAIRY COUNCIL—DAIRY FARM COMPETITION, 1935.

CONSERVATION OF FODDER SECTION.—HILLS DISTRICT AND MURRAY SWAMPS.

[Judged by R. Hill, District Agricultural Instructor.]

Meadow Hay and Ensilage Competitions conducted in recent years have now been combined and other fodder crops added in order to provide a Competition for Conserved Fodders. This Competition, combined with those for Pastures and the best Dairy Herd, provide a general Dairy Farm Competition with a prize for the aggregate.

The Conservation of Fodder Competition has been judged on the following scale of points:—

	Points.
Hay	60
Ensilage	60
Amount conserved per cow	60
Other crops	20
Total	200

It is unfortunate that a number of the competitors were not represented in all sections, and in some cases only Meadow Hay was entered. However, the Competition has provided data showing to what extent conserved fodders can be utilised and the feed question made secure.

The carrying capacity of holdings, so far as the Hills Districts are concerned, has been decidedly advanced with the curing of Meadow Hay being better understood than was the case a few years ago and the making of Ensilage having progressed past the experimental stage.

It was pleasing to notice on some farms visited that the Pastures were well grazed down, preventing unnecessary waste, and every opportunity had been taken to utilize the strong, spring growth as Conserved Fodder either as Hay or Ensilage. Approximately 3 tons of conserved fodder per cow were stored on several of the farms visited, and in one case it was as high as 5½ tons, showing what can be done, and providing an excellent object lesson to any interested in improving the carrying capacity of their holdings. From a dairyman's point of view, both Ensilage and Hay are essential, and neither should be used as a sole ration. Ensilage has decided laxative qualities, and in addition helps digestion—both very important factors when considering economical feeding for dairy cows, and all dairymen should give that type of conserved fodder more consideration.

Although the practice of using salt in Haystacks is becoming more general, much more consideration should be given to its use, both as a protection against firing and its assistance in promoting a more palatable feed.

Cultivated crops for grazing purposes in the Hills Districts do not attract a great deal of attention, because of the area and number of fields necessary to carry on such work successfully, but such crops grown for cutting and hand-feeding might be given more consideration.

PASTURE SEEDS.

WIMMERA RYE GRASS.	**LUCERNE.**
PHALARIS TUBEROSA	**SUBTERRANEAN CLOVER.**
PERENNIAL RYE GRASS.	**STRAWBERRY CLOVER, Etc.**

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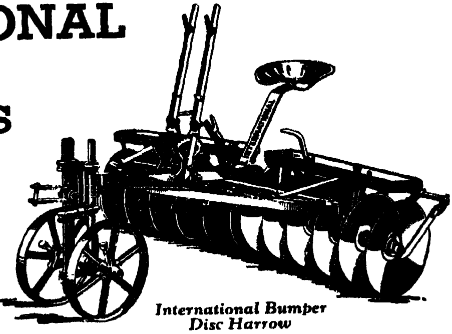
● Generations of capable farmers have tested and proved the quality of International harrows which are made from a close knowledge of practical farming requirements.

INTERNATIONAL BUMPER DISC HARROWS

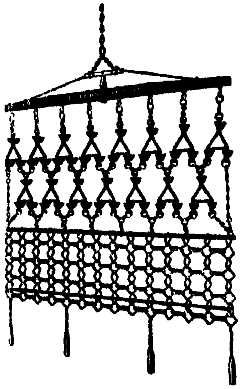
● One of the most popular and useful tillage implements made, the International bumper disc harrow is sturdy in structure and simple in design. Made in 5, 6, 7 and 8-ft. sizes with 16-inch discs and 6, 7 and 8-ft. sizes with 20-inch discs. Tandem attachment available.



International Bumper Disc Harrow

INTERNATIONAL PASTURE HARROWS

● Made entirely of steel the International pasture harrow is simple in construction, sturdy, flexible, light in draught. Breaks up sod-bound land and opens up the soil so that fertilizer can be worked into the roots. Also breaks up and distributes animal manure evenly over the pasture. Works effectively in tussocks or in heavy dry grass. Made in 5, 8, 10 and 15-ft. sizes.



International Pasture Harrow

INTERNATIONAL DIAMOND Smoothing Harrows

● This is a light, serviceable steel harrow which conforms to the surface of the ground. Frame made of channel and flat steel bars and the teeth of high quality steel with threaded heads inserted through the frame bars. Made in 20-tooth sections 40 inches wide. Supplied with as many sections as required.

INTERNATIONAL HARVESTER COMPANY
OF AUSTRALIA PTY. LTD.
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Q1403

HILLS DISTRICT.

CONSERVATION OF FODDER.

Results.

Position.	Name.	Address.	Hay.					Ensilage.						Amount conserved per Cow.	Other Crops.	Total.
			Suitability of Plants.	Curing.	Stage of cutting.	Apparent Nutritive Value.	Storing.	Suitability of Plants.	Succulency.	Palatability.	Aroma	Charring.	Mould.			
			10	15	15	15	15	10	10	15	5	10	10	60	20	200
1	J. Brook	Meadows	9	13	14	13	4	8	8	9	4	9	9	60	14	174·0
2	J. M. Irwin	Mount Barker	8	13	14	13	4	9	9	9	4½	8	9	60	12	172·5
3	T. M. Smee	Charleston	9	12	13	13	4½	9	8	8	4	9	8	60	.5	162·5
4	R. G. Magor	Myponga	9	13	13	13	4	9	9	9	4½	8	8	60	—	159·5
5	Smith & Woolley	Blackwood	9	13	12	13	5	8	8	9	4½	7	8	50	10	156·5
6	H. A. Woolley	Mt. Barker Junction	8	13	12	12	4	9	9	9	4	7	8	50	10	155·0
7	R. C. West	Myponga	9	12	14	13	4½	8	7	7	4	8	9	50	—	145·5
8	E. H. Coote	Middleton	8	12	11	12	3	—	—	—	—	—	—	40	16	102·0
9	H. B. Peters	Mount Compass	7	14	14	12	4½	—	—	—	—	—	—	25	14	90·5
10	Chas. E. Verco	Mount Compass	7	14	14	12	4½	—	—	—	—	—	—	30	5	86·5
11	G. Maslin	Myponga	7	12	11	11	4	—	—	—	—	—	—	30	—	75·0
12	R. C. Llewellyn	Myponga	8	13	11	13	4	—	—	—	—	—	—	20	—	69·0
13	F. Summers	Myponga	7	11	13	12	4	—	—	—	—	—	—	20	—	67·0
	MURRAY SWAMPS.															
1	H. H. Jericho	Jervois	8	12	11	11	3½	8	8	8	4½	7	8	40	18	147·0
2	E. Wise	Jervois	7	11	11	11	3½	8	7	7	3½	6	8	20	15	118·0

THE GROWING OF CANARY SEED (*PHALARIS CANARIENSIS*) IN SOUTH AUSTRALIA.

[By R. HILL, District Agricultural Instructor.]

For many years odd crops of canary seed have been grown in this State, and it seems possible to grow reasonably good yields and fair quality seed in most of the cereal growing districts favoured with a rainfall from 17in. and over per annum, but during the last few years the area sown to this crop has increased considerably.

The total quantity of seed harvested this season will be in the vicinity of 850 tons, and the amount of seed required for birds locally will, at the most, be 450 tons.

However, the price is good and local growers have benefited, but this position cannot be expected to continue, and any prospective growers should give the matter full consideration before making a decision.

The total annual requirements throughout Australia are in the vicinity of 2,500 tons, and of this Queensland has been the main supplier, but a poor season for the crop in that State, coupled with the fact that Victoria will have only about 100 tons, or 25 per cent. of her expected crop, has placed South Australian growers in a very favourable position.

Should the area under crop continue to increase and only a moderate season be experienced in all States, prices are sure to fall, with the only possible outlet of exporting at a price not remunerative to the grower.

South Australian growers have formed an association which entrusts its business to Messrs. Whiting and Chambers, and both Queensland and Victoria have their respective associations of growers. These three bodies have formed an Australian association, hoping that the area cropped and the general quality of seed marketed will come under some definite control.

Whilst prices have been good, there has been a tendency in this State to overlook the important item of quality, and until more attention is directed to careful harvesting, there is little hope of building up a high standard of quality that is so much desired.

All plants of the *Phalaris* family have the peculiarity of ripening the seeds at the apex of the head earlier than the remainder, and those seeds show an inclination to shake out before the lower seeds are fully matured.

Such a condition presents difficulties at harvest time unless the crop is cut with a binder at a stage when the earlier ripened seed will not shake out. Allowed to complete ripening in the stook, the seed will be more uniform and can be threshed through an ordinary threshing machine without undue harm to the seed. Such a method of harvesting involves more labour, which is to some degree overcome by additional yield and less damage to seed.

Skinned seed is not appreciated by birds, and any degree of skinning considerably reduces its value, due to the waste when fed to them, a fact which must be realized by growers if a market for their produce is to be held.

As indicated by the figures quoted, there is a limited demand for canary seed in Australia, and unless the industry is controlled and the production of good quality seed left to growers who are in the position to handle the crop with suitable equipment, there is likely to be a decided slump in prices which might possibly discourage growers to the extent of disorganising the local supply and giving the industry a decided check.

ASSISTING LANDHOLDERS IN CLEARING OPERATIONS.

[A. C. H. RICHARDSON, Chairman Unemployment Relief Council.]

For the twofold purpose of placing men in employment and assisting primary producers to undertake work to bring more land under cultivation which, through lack of finance they would otherwise be unable to do, the Unemployment Relief Council has undertaken a scheme of clearing land for farmers.

The farmer who desires to take advantage of this scheme is required to state the area which he desires cleared and give a general description of the type of growth on the land in question. He is also asked to state the rate per acre which he is prepared to pay.

In the event of the Council granting assistance it is essential that there must be reasonable security available for the repayment of the advance made. The farmer should, therefore, give particulars of his title to the land, whether it is freehold or leasehold, and if encumbered, details of the encumbrance should be supplied. The repayments will be spread over a reasonably long term. Nothing is definitely fixed in this direction, but if the farmer indicates the period over which he desires repayment spread, this can be considered and mutually fixed. The rate of interest charged for the advance is reasonable, being only 4½ per cent.

After an arrangement is entered into between the Council and any landholder it will be necessary to have a suitable camping site in close proximity to the clearing operations. An ample water supply for drinking and washing purposes is essential, and such factors as accessibility for conveyances and suitable arrangements being made for stores and provisions will be considered in the selection of the site. All campng equipment, tools, &c., will be supplied by the Council, and the men sent to the job will be required to work under the Petty Contract System. In this respect the matter is one enirely between the landowner and the workmen—the Unemployment Relief Council finds the labour and provides the finance only. Each fortnight the area cleared can be measured by the farmer so that the men can receive their payment in accordance with the services rendered.

Work has been undertaken under similar conditions by the Council previously, and apart from huge areas which have been cleared for forestry purposes, the Council has done several clearing jobs for farmers, but it is felt that the scheme and the method of its working are not generally known by those who have land which they require cleared. At Coonalpyn 1,008 acres were cleared and grubbed for Mr. W. B. Watson, and he found the scheme quite satisfactory and was pleased with what was achieved.

The Council feels that many acres on various holdings have not been reclaimed from natural forest because of lack of finance and the difficulty of over-burdening the property to such an extent as would make farming unproductive. In devising this scheme the Council asks for only reasonable security, and it will be generally agreed that where it is dealing with public funds this course is necessary, quite apart from being a general practice of business. It has spread the period of repayment over a long period and has set the interest at a reasonable rate.

In inaugurating this scheme the Council feels that in its efforts to relieve unemployment, it could not do better than turn to the primary producers of the State, for it believes that any help rendered in this direction, which will be of genuine help to the farmer, is likely to have a lasting effect on the community as a whole.

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR FFEBRUARY, 1936.

Herd No.	Average No. of Cows in Herd.	Agerage No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February.	Per Cow March to February.	Per Herd during February.	Per Cow during February.	Per Cow March to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A	30	24·52	14,143½	471·45	5,299·79	715·19	23·84	268·28	5·06
9/C	16	12·86	7,704	481·50	6,249·52	331·62	20·73	269·76	4·30
9/D	30	17·66	12,338	411·27	4,902·81	610·39	20·35	262·99	4·95
9/E	13·28	11·38	6,684	503·30	5,993·48	288·33	21·71	293·48	4·31
9/F	17	11·07	4,053½	238·43	5,499·23	144·77	8·42	243·61	4·24
9/G	33	27	14,587	442·03	6,440·68	717·28	21·74	327·24	4·99
9/I	28·86	22·45	6,839	236·97	5,769·08	325·36	11·27	249·64	4·76
9/J	11	9·97	6,673½	606·68	7,016·28	272·30	24·75	294·19	4·08
9/L	32·24	15·14	4,676½	145·05	4,118·13	214·52	66·54	228·53	4·59
9/O	28·55	24·07	10,572½	370·31	5,971·11	460·00	16·11	271·52	4·35
9/P	44	16·10	3,377½	76·76	4,983·30	178·17	4·00	246·29	5·22
9/T	19·93	15·24	5,338½	267·86	5,580·52	232·74	11·68	252·40	4·36
9/W	28·26	22·90	14,809	524·02	6,579·77	606·75	21·47	279·98	4·10
9/X	11	8	3,584½	326·53	5,308·20	184·06	17·00	273·05	5·24
9/Y	12	7	4,451½	370·95	5,945·53	166·05	13·84	240·01	3·73
9/Z	13·45	10	2,688	199·87	4,058·61	145·56	10·83	209·63	5·42
9/Aa	15·31	8·90	2,169½	142·14	5,369·67	118·70	7·77	292·77	5·45
9/Bb	28·90	27·48	19,602½	678·29	5,341·96	937·41	32·56	261·00	4·69
9/Cc	17·62	2·83	743	42·17	5,399·76	39·28	2·23	290·58	5·29
9/Ee	37·14	26·66	8,627½	232·21	3,635·12	453·66	12·21	180·96	5·29
9/Dd	16	14·66	5,532½	345·78	3,565·58	230·25	14·39	163·83	4·16
9/Gg	10	7	3,610½	361·05	—	191·06	19·11	—	5·29
Means	22·43	15·59	7,398·00	329·77	5,331·24	325·38	14·50	252·46	4·64

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February.	Per Cow December to February.	Per Herd during February.	Per Cow during February.	Per Cow December to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B	16	14·21	5,051½	315·72	1,119·97	252:35	15·77	53·96	5·00
6/C	20	18·76	12,516½	625·83	2,005·29	508·54	25·43	85·59	4·06
6/Y	14·34	14·34	12,584	877·54	2,600·93	533·73	37·22	106·43	4·24
6/Ff	30·62	26·07	22,941½	749·21	2,424·25	996·71	32·55	101·32	4·34
6/Kk	16	12·93	8,970	560·62	1,436·49	353·25	22·08	58·63	3·97
6/Ll	24	20·10	15,395½	641·46	1,827·14	551·45	22·98	66·17	3·58
6/Oo	20·97	16·55	13,746½	655·53	2,432·39	593·51	28·30	105·13	4·32
6/Ss	15·90	13·03	12,834	807·15	2,712·09	465·06	29·25	97·43	3·62
6/Tt	28	26·72	20,320	725·71	2,334·25	821·30	29·33	98·72	4·04
6/Vv	28·83	25·24	22,611½	784·30	2,523·84	1,007·11	34·93	115·47	4·45
6/Xx	27·72	22·69	17,381½	627·03	2,101·01	677·31	24·43	84·37	3·90
6/Ddd	24·83	23·59	16,630	669·72	2,220·96	658·49	26·52	90·91	3·96
6/Mmm	10·79	8·07	7,666½	710·51	1,980·03	309·30	28·67	81·08	4·03
6/Ooo	29·07	23·31	21,578½	742·29	2,521·29	926·57	31·87	108·22	4·29
6/Rrr	39·97	36·31	28,287½	706·46	2,156·04	1,082·08	27·07	82·55	3·83
5/Sss	36·03	32·17	27,789½	769·51	2,461·42	1,091·76	30·29	96·20	3·94
6/Ttt	25	20·86	15,779	631·15	1,883·37	748·94	29·96	85·72	4·75
6/Pp	14·10	13·07	8,089½	573·72	1,964·68	397·91	28·22	97·89	4·92
6/Uuu	63·38	55·31	42,421	669·31	2,046·04	1,776·39	28·03	87·39	4·19
6/Vvv	44	39·93	27,129½	616·58	2,112·15	1,015·78	23·09	81·13	3·74
6/A	10	9·59	2,874½	287·45	1,146·15	153·04	15·30	59·59	5·32
6/Ppp	22·34	20·48	16,582½	764·13	2,542·73	669·00	31·31	104·20	4·09
Means	25·54	22·42	17,230·93	674·65	2,164·62	708·62	27·75	89·84	4·11

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February.	Per Cow July to February.	Per Herd during February.	Per Cow during February.	Per Cow July to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H	8·41	6·41	3,126	371·70	3,941·33	149·72	17·80	202·77	4·79
7/P	30·69	23·55	10,975	357·60	4,724·09	496·17	16·17	217·33	4·52
7/Tt	17	15	7,163	421·35	5,272·47	273·81	16·11	220·69	3·82
7/Ddd	12	11·48	6,334½	527·87	5,689·25	267·95	22·33	268·53	4·23
7/Bbb	78·48	66·17	31,296	398·77	4,221·47	1,194·89	15·23	185·45	3·82
7/Eee	12	6·48	2,658	221·50	4,290·27	139·55	11·63	213·64	5·25
7/Ggg	18	14·86	5,865½	325·86	3,724·94	275·81	15·32	170·46	4·70
7/Hhh	14	14	6,046½	431·89	4,840·81	199·81	14·27	157·59	3·30
7/Iii	15	14·90	9,091	606·07	5,196·60	300·36	20·02	179·41	3·30
7/Kkk	25·90	24·31	10,169½	392·39	5,066·94	439·33	16·94	238·07	4·36
7/Mmm	16	13·14	5,322	332·62	4,106·54	270·27	16·89	214·39	5·08
7/Nnn	16·72	15·48	7,986	477·62	5,232·44	338·62	20·25	224·05	4·24
7/Ooo	24	22·31	12,102½	504·24	4,189·16	436·79	18·20	166·48	3·61
7/Ppp	17·59	12·34	5,819½	330·84	4,007·01	253·33	14·40	191·55	4·35
7/Qqq	22	22	7,438½	338·11	4,734·77	330·24	15·01	220·10	4·44
7/Rrr	20·79	19·10	7,915½	380·73	4,059·21	348·09	16·74	178·04	4·40
7/Sss	8	6·24	5,365½	670·69	5,530·97	233·26	29·16	219·30	4·59
7/Ttt	8	6	3,581½	447·69	5,299·68	122·38	15·30	212·62	3·42
7/Uuu	23·66	20·17	7,057½	298·28	3,522·60	289·80	12·25	148·49	4·11
7/Vvv	21	18·17	9,155	435·95	4,090·65	379·87	18·09	179·29	4·15
7/Www	20	17·14	9,313½	465·67	3,073·23	379·52	18·98	126·06	4·08
7/Xxx	26	23·62	10,780½	414·63	2,956·53	406·96	15·65	112·23	3·77
Means	20·69	17·86	8,389·20	405·42	4,564·32	342·11	16·53	198·24	4·08

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February.	Per Cow Octobor to February.	Per Herd during February.	Per Cow during February.	Per Cow October to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C	36	20·55	13,120	364·44	3,330·27	682·03	18·95	177·33	5·20
5/D	31	22·07	10,689½	344·81	2,552·41	544·58	17·57	137·55	5·09
5/E	38	24·45	16,343½	430·08	2,729·94	871·19	22·93	140·87	5·33
5/R	70	58·07	22,992½	328·46	2,193·25	1,062·15	15·17	98·65	4·62
5/Z	42·07	33·83	26,733	635·42	3,271·55	1,267·04	30·12	170·68	4·74
5/Ee	16	16	9,193	574·56	3,394·34	463·19	28·95	170·06	5·04
5/Xx	26	16·93	4,565½	175·60	1,995·70	251·28	9·66	101·21	5·50
5/Yy	10	6·62	3,161½	316·15	1,644·12	139·98	14·00	82·10	4·43
5/Aaa	20	18·31	10,651	532·55	3,018·35	527·25	26·36	148·45	4·95
5/Bbb	18	18	4,188½	232·69	2,443·75	195·92	10·88	121·10	4 68
5/Eee	26·83	20·76	15,393½	573·72	2,408·03	655·88	24·45	108·23	4·26
5/Hhh	14	9·21	4,756	339·71	2,704·38	190·78	13·63	111·90	4·01
5/Jjj	27	7·66	2,982½	110·46	1,719·73	174·76	6·47	107·86	5·86
5/Aa	20	18·28	9,646½	482·33	2,755·13	436·32	21·82	119·82	4·52
5/Kkk	16·83	11·62	4,211	250·21	1,582·64	212·77	12·64	75·44	5·05
5/Lll	15·48	11·45	4,287½	276·96	2,798·21	190·05	12·28	124·41	4·43
5/Rr	24·28	19·72	6,253½	257·55	2,314·18	334·75	13·79	123·44	5·35
5/Mmm	32	26·93	17,690½	552·82	3,407·14	801·31	25·04	161·41	4·53
5/Nnn	24·59	22·72	8,671½	352·59	2,806·86	482·52	19·62	143·35	5·57
5/Ooo	23	21·76	2,2649½	984·76	4,066·78	864·32	37·58	164·81	3·82
5/Ppp	29	17·03	7,192½	248·02	2,274·71	295·59	10·19	93·11	4·11
5/Qqq	30	23·59	9,489½	316·32	2,138·76	471·31	15·71	111·48	4·97
Means	26·82	20·08	10,675·55	398·02	2,625·61	505·22	18·84	128·28	4·73

PAPERS READ AT CONFERENCES.

PEAS ON THE FARM.

[W. F. WURST, Laura.]

The Early Brunswick White is the best variety of pea for northern conditions. The Early Dun is about two weeks later; it grows a lot of bulk, but not so much grain, and, being late, it is far more subject to the attack of grubs. The Brunswick is a hardy pea, being early and of good feeding quality. Not growing so much bulk, it is much easier to harvest with present-day machines. In a district with a fair rainfall, it will grow quite well on stubble ground. The stubble should be burnt or cleared off; then, after the first rain, either ploughed or cultivated about April or May, well cleared of all stones, &c., and sown with about 60lbs. to 80lbs. of seed and a liberal dressing of manure at about the end of June. If the peas are sown too early they are likely to be caught by frost. If sown too late they are subject to the ravages of grubs.

Be careful to kill weeds as far as possible. After seeding, roll the soil down well, as that will save a lot of trouble, time, and waste at harvesting. If the soil is well rolled the peas may be cut with the binder just before they are ripe, especially if there are some wild oats, &c., in the crop. This can be thrashed later, the straw making an excellent standby for idle stock in winter months. Sheep will do well on pea stubble with a liberal supply of water. They will fatten more quickly than on any other feed, giving a good, solid, juicy mutton. The sheep will pick up practically every grain. Farmers cannot expect soils to keep in the best producing condition with a continual wheat-fallow-wheat rotation, and there is nothing better than a change with peas. To keep the soil fertile a good plan is to give it a rotation of wheat (or oats), peas, fallow, wheat, peas, fallow. This will give two crops in three years, and will enrich the soil. It is a far better policy to sow smaller areas and have a good crop than a big area with a poor return.

Two years ago I started by sowing 60 acres, last year 250 acres, and it is my intention to sow 350 acres this seeding with peas.

THE GROWTH OF BEETALOO VALLEY.

[J. ARTHUR, Beetaloo Valley.]

Formerly, what is now Beetaloo Valley was partly Napperby and partly Beetaloo Stations, held as pastoral leases. Through the influence of Mr. Howe, then a Member of Parliament, a closer settlement scheme was instituted. Blocks of land were selected, varying in size from 20 to 100 acres. This scheme—which ultimately proved a failure—partially, at any rate, meant the opening up of what is now a wonderfully fertile belt of both agricultural and horticultural land. The early settlers had a colossal task ahead in clearing land which was hilly, heavily timbered, and containing stone reefs. Mixed farming was the idea of this closer settlement scheme, and gardening was to be the main feature. The hills in Beetaloo Valley became dotted with vineyards and orchards, comprising citrus and stone fruits, but, through lack of organisation, they found only a limited market for what they could produce; also these small areas proved far too small; so one by one allotments were forfeited, to be re-allotted—in some cases sold to more prosperous neighbours—until to-day Beetaloo is carrying prosperous farmers, with holdings from 500 to 1,000 acres, with a few smaller properties devoted to gardening.

It is true that during the last decade the annual rainfall has dropped to the extent of nearly 10in. As a result, stone fruit orchards and vines have gone almost out of existence, leaving mainly citrus fruits, which are sustained by a system of irrigation from the Beetaloo Reservoir. One of the chief drawbacks to the early settlers of Beetaloo was the fact that little was known of the value of superphosphate. It is feasible to assume that had artificial manures been scientifically prepared 50 years ago as they are to-day, mixed farming would be the order of the day in Beetaloo Valley on holdings up to 200 acres, unless, of course, the fall in the annual rainfall proves to be permanent. With a 29in. rainfall, which was the case a decade ago, and which will surely return, and with the present-day knowledge of the value of artificial manures, two to four families could live where one exists to-day by utilising to its fullest capacity a holding of 200 acres. The fruit-growing industry has never been organised in Beetaloo. This could, and would be done if sufficient fruit was grown to warrant it; but it will never be done while holdings range from 500 to 1,000 acres.

The decrease in annual rainfall, although a drawback to the gardener, has been a boon to the wheatgrower. It enables him to cope more easily with weeds, which prove a pest in wet winters, and it is safe to say that the average yield per acre during the drier seasons has been greater than previously. During nine years' residence in Beetaloo I have never seen a bad crop of wheat. I know of no farmer in Beetaloo who could not cut from 30cwts. to 2 tons of hay per acre, and wheat yields are invariably from 20bush. to 30bush. per acre.

LOWER SOUTH-EAST, KYBYBOLITE, 8th APRIL, 1936.

WIMMERA RYE AND *PHALARIS TUBEROSA* ON RED GUM LANDS OF THE SOUTH-EAST.

[By L. J. Cook, Manager Kybybolite Experimental Farm.]

It is most necessary to consider the grass varieties that are suitable to the South-East and its climate, because they are essential for use and maintenance of pasture, now fully recognised as our most stable crop.

Subterranean and other clovers are invaluable pasture plants, but they cannot and will not make a persistent pasture. It is only by a combination of grass and clover with good fertilising and proper management that continuously healthy and productive pastures can be maintained. Clovers make quick use of phosphatic fertiliser, and are able to secure their nitrogen requirement from the air per the medium of root bacteria, which at the same time supply an excess of nitrogen that combines with the chemical bases of the soil for use by other plants such as grasses.

Grasses also make use of phosphatic fertiliser, but in addition they require readily available nitrogen in the soil for their proper growth.

Consequently soils—such as most of those in the South-East—that are naturally very low in phosphates and nitrogen respond to the following treatment:—Phosphatic fertiliser applied to a clover pasture cause—during the first two to four seasons—a dominance of clover growth, as much as 80 per cent. to 90 per cent. of the total growths at times. This period is followed by better grass and a reduction of clover, brought about by the added nitrogen made available in the soil by the clover growths, and after a period of 8 to 10 years' development grass produces 60 per cent. to 70 per cent. of the pasture growths. These latter pastures are of greater utility to livestock, providing a variety and better balance of food.

For quite a number of years grass growths have been under observation, and trials conducted with introduced species, in order to obtain the most suitable and productive for the soil and climate. Many of these trials have been made on undeveloped land, and of later years trials have been set on the more or less partly-developed soils. Much is still to be done, testing under different methods of management, fertilisation, &c., but the purpose of this paper is to deal principally with the results so far obtained. Conclusions arrived at under practical trials indicate that only two of the introduced grasses are outstanding and are to be recommended, namely, Wimmera or Annual Rye Grass and *Phalaris tuberosa* (Perennial Canary Grass). These two are of quite different type. Wimmera Rye is an annual, growing from seed each autumn, producing dark green, narrow-bladed leaves, makes quite good winter feed and a luscious amount of spring growth. *Phalaris tuberosa*, on the other hand, is a deep-rooted perennial, is very drought-resistant, and can live through dry summer periods. It produces light green, fairly broad-bladed leaves, and makes a fairly quick bite of green from autumn rains, is a good winter grower, and makes growth later into the summer than any other winter grass tried. Hence these two grasses require quite different treatment and management.

WIMMERA RYE GRASS.

Wimmera Rye is a prolific seeder of very viable seed, and it is not difficult to secure a good germination provided a reasonable seedbed is given. Sown in autumn it can be grazed well during its first winter until spring, when it is most essential that it be allowed to mature a good proportion of seed. Heavy grazing in late spring is very detrimental to its persistency, as livestock are particularly fond of its palatable seed heads. If allowed to seed well the first season it is not so necessary to control the spring grazing during future seasons, except that it might be advisable every third or fourth season to allow it a fair spell to mature seed. Autumn harrowing will aid its growth and persistency. Spring mowing for ensilage and hay will materially aid it, provided the mowing is not left too late in the season. Cut off early, naturalised annuals such as Silver, Barley, and Brome grasses can be checked to the advantage of Wimmera Rye. Wimmera Rye Grass in pastures properly managed noticeably reduces the amount of other annuals such as Cape Weed and the grasses mentioned above. It can, with advantage, be established with Subterranean Clover in the initial stages of development of these lands, and although, of course, it makes far better and more healthy growth in later stages of development, it does better than other grasses in the early stage, and is most useful for livestock at this period.

PHALARIS TUBEROSA.

Phalaris tuberosa is not a prolific seeder under local conditions, and there is a large variation in the viability of its seed. The cost of the seed is much greater than that of Rye Grass, and it is more difficult to obtain a good germination. It is a slow grower during the first six months of its life, and consequently does not appreciate competition at this period. Therefore, to establish, it is necessary to prepare and clean the land very well. Sown in autumn, it will give very little feed during the first winter, but will make useful growth in spring and early summer. During the second and future seasons it will hold its own and persist for a good many years under proper management. It is advisable to use the mower freely in spring during early seasons of its development to check annual grasses. When its plants become larger and well established it will better defeat the annuals, but during the early years it is noticeable that annuals are more plentiful amongst it than in the Wimmera Rye Grass plots. Autumn harrowing should be an advantage.

Except for the first year of growth, the grazing of *Phalaris* need not be interfered with, provided that the grazing is so managed to enable the maintenance of healthy plants. Rotational grazing should be observed during the growing period in order to allow sufficient top growth to maintain vigorous root development and prevent over-grazing of such a very palatable species as *Phalaris*.

Unlike Wimmera Rye Grass, *Phalaris* cannot be so well recommended for sowing on virgin land. It will not produce the quantity of grass amongst the

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clover during the first two seasons, and results in the production of a lot of weak plants.

It is the only persistent perennial that can be recommended for establishing on the land, after the soil has been built up with clover and phosphates for a period of years.

PRACTICAL RESULTS AT KYBYBOLITE.

Regarding practicable comparable trials of the two grasses, work with *Phalaris tuberosa* was commenced in 1930. Previous to this, small hand plot trials had shown the persistency of the grass, but it was not until 1930 that an area of 5 acres was established to commence a test of its grazing capabilities. This was established on virgin land, and six years' grazing in conjunction with Subterranean Clover has yielded 3.14 sheep per acre per annum, besides a cut of 21cwts. of hay per acre in 1934. During 1935 it has carried 4.1 sheep per acre.

A similar plot established with Wimmera Rye Grass at about the same time has returned 2.88 sheep per acre per annum, as well as a cut of 21cwts. of hay per acre in 1934. During 1935 this plot carried 4.4 sheep per acre. In 1934 a more comprehensive test of the two was commenced, and three more pairs of plots were established that year—one pair on virgin land, one pair after four years of clover development, and one pair after 10 years of clover development. Besides using these as a test on the quantity of grazing, the Waite Research Institute is assisting in the anlyses of growths and in the testing of the development of sheep on each type of pasture. The wool experts of the School of Mines, Mr. Codrington and his assistant Mr. Goddard, are also assisting with the selection of sheep and the valuing of the wool produced. This sheep work was commenced in 1935, and will be continued for five seasons.

More work must be recorded before any definite comparison of the grazing capacity of the two grasses can be quoted. All plots have been well covered with sown grass, naturalised grasses, clovers, &c., and so far there has been no material difference between their bulk of grazing.

Botanical estimations of these pastures have been made by the Farm Assistant, Mr. J. D. McAuliffe, by taking indiscriminate quadrat readings monthly throughout 1935 on the eight plots, and the following table shows the average botanical analysis for this season, and illustrates several important factors: –

Botanical Analyses of Wimmera Rye and Phalaris Tuberosa *Plots*, 1935.

Plot.	*Phalaris tuberosa.*	Wimmera Rye Grass.	Naturalised Annual Grass.	Subterranean Clover.	Thistles.	Capeweed.	Erodium.	Miscellaneous.	Bare Space.
	%	%	%	%	%	%	%	%	%
Sown 1934 after 10yrs. dev.									
C 1. Wim. Rye Grass....	--	58·70	14·70	9·20	4·80	0·20	—	2·70	9·70
C 2. *Phal. tuberosa*	34·86	—	37·29	16·00	2·07	1·50		1·50	6·79
Sown 1934 after 4yrs. dev.									
P 16 Wim. Rye Grass ..	—	56·67	10·00	23·17	0·17	--	—	0·25	9·75
P 15 *Phal. tuberosa*	26·79	—	19·00	42·43	3·64	0·79	—	2·43	4·93
Sown 1934 on virgin soil									
P4A Wim. Rye Grass ...	—	33·80	8·10	53·10	0·20	trace	--	0·50	4·30
P3A *Phal. tuberosa*	13·17	--	17·75	65·58	0·75	trace	trace	0·41	2·33
Sown 1930 on virgin soil									
P 14 Wim. Rye Grass ..	—	22·38	14·50	62·44	0·13	0·06	0·13	0·06	0·31
P 17 *Phal. tuberosa*	12·93	--	26·07	60·50	trace	trace	—	0·14	0·36
Average—									
4 Wim. Rye plots.......	—	42·89	11·83	36·98	1·32	0·06	0·03	0·88	6·01
4 *Phalaris* plots	21·94	—	25·03	46·13	1·61	0·57	—	1·12	3·60

Dev. = Development.

The principal factor shown is the reduction of naturalised annual grasses on the Wimmera Rye Grass plots. In every pair of plots the percentage of these is much higher (over 100 per cent.) on the *Phalaris tuberosa* plots. On the four Rye Grass plots the percentage of these annual grasses is 11.8, whilst on the four *Phalaris* plots it is 25 per cent.

Secondly, the percentage of Rye Grass to *Phalaris* on each pair of plots is greater; on the average 42.9 per cent. to 21.9 per cent.—almost 100 per cent. better. The total grass on the Wimmera Rye pastures is approximately 55 per cent., 43 per cent. Wimmera Rye, and 12 per cent. other annual grasses, whereas the total grass on the *Phalaris tuberosa* pastures is approximately 47 per cent., 22 per cent. *Phalaris* and 25 per cent. annual grasses. Thistles, Capeweed, and miscellaneous plants are present in greater quantity on the *Phalaris* pastures.

Considering the three *Phalaris* pastures established in 1934, it is significant that this grass is represented by 35 per cent. of the pasture when sown after 10 years' improvement, 27 per cent. when sown after four years' development, and only 13 per cent. when sown on virgin land.

Wimmera Rye Grass under similar treatment has produced 59 per cent., 57 per cent., and 34 per cent. respectively.

Comparing the pair of plots P3A and P4A, established on virgin land in 1934, it is found that Wimmera Rye comprises 34 per cent. of the pasture on its plot, whereas *Phalaris tuberosa* comprises only 13 per cent. of the pasture on its plot.

Plots P14 and P17 that were sown in 1930 are interesting, and show Wimmera Rye in much greater proportion than *Phalaris*. The comparatively low amount of grass and high amount of clover on both these plots, is due to the fact that they were mown for hay in 1934. In fairness to P17 it must be stated that the *Phalaris* was established here with only 2lbs. seed per acre. The later plots were sown with 4lbs. seed, and it will be interesting in future years to compare the development of *Phalaris* plants on C2 and P15 with those on P3A. Much larger and more vigorous plants are at present on C2 and P15, due to the previous developmental treatment given to these soils, and it can be quite anticipated that they will continue to develop better and maintain a better percentage than is at present showing on P17.

SHEEP ON WIMMERA RYE AND PHALARIS TUBEROSA PASTURES.

Regarding the development of sheep on these two types of pasture, 40 ewe weaners were selected of even type and development, of an average live weight of 58lbs., and were placed on each pasture in April last. Both flocks reached their maximum live weight for the season in January of this year; those on Wimmera Rye pasture weighing 101.3lbs. average, and those on *Phalaris* pasture 100.2lbs. In February the former had fallen to 94lbs. and the latter to 92lbs. average.

Those on the Wimmera Rye have been slightly ahead all the season, and produced 9lbs. 3ozs. of wool valued in October at 10s. 9¼d. per head, whilst those on *Phalaris* pasture produced 8lbs. of wool valued at 9s. 8¼d. per head.

The fleece wool of both flocks only varied 2½d. per head, that of the weaners on Wimmera Rye Grass averaged 15d. per lb. and that of the weaners on *Phalaris tuberosa* averaged 15¼d. per lb.

Of the 40 fleeces taken from weaners on Wimmera Rye pasture, one was valued over 17d., eight over 16d. and under 17d., and four were valued below 14d. Of the 40 fleeces taken from weaners grazed on *Phalaris* pasture, one also was valued over 17d., 13 over 16d. and under 17d., but none were valued below 14d. per lb.

Not much notice of these sheep results should be taken, for as yet they are only one season's result, but they will be used as a basis for comparing the clips from these sheep in future seasons.

[*Papers Read at Conferences.*]

SUMMARY.

1. Recommend that Wimmera Rye Grass be used with Subterranean Clover for the initial development of these lands.

2. *Phalaris tuberosa* with Subterranean Clover and naturalised grasses will produce equal carrying capacity as Wimmera Rye and Subterranean Clover, but it is advisable to delay its establishment until the land has been partly developed.

UPPER SOUTH-EASTERN BRANCHES, BORDERTOWN,

1st APRIL, 1936.

GENERAL FEEDING OF STOCK.

[A. E. MILNE, Tatiara.]

HORSES.

A foal should be weaned from the mother at five to six months old. If possible, have the foal in a strong yard with stable or loose box attached. Have water laid on and a trough, so the foal can get it any time it likes. Do not feed too heavy; make the feed green chaff and plenty of bran and a good allowance of crushed oats. If the foal does not eat all the feed, clean it up and give less. In spring, do not feed too much chaff, provided there is plenty of natural feed. At this stage the colt should develop, but not get too fat.

From now on, give as much as the colt will eat, but if possible the best of food. At two and a half to three years, the colt is ready to handle. As the colt works be liberal with the feed—four times a day. Do not make the midday feed too bulky, but good.

The master must use his own judgment. Some horses will eat much more than others. Do not give more than they will clean up. The stomach of a horse is small, and the animal cannot do his best if he is too full. Oats are the best feed at any time the horse is at work, and should be crushed to help digestion. If not crushed, steep in hot water. If the tin is covered with a bag it will give good results. Allow the horses plenty of water before feeding, and very little, if any, after. Too much water helps to dispose of the food before it has been digested.

To sum up. Feed the best chaff made from hay cut on the green side together with oats and bran, mixing a little salt. Put salts in the drinking water. Do not tip a bran bag of chaff to two or three horses.

COWS.

At all times, dairy cows will respond to green feed in any shape or form. Therefore, grow barley or rye for early feed, maize or sorghum for summer feed to cut, and Sudan grass for a summer feed.

As to feeds that will produce milk; green wheaten hay and crushed oats are excellent and both grow on the holding. If purchases have to be made from outside, nothing beats bran. The best way to give cows salt is double handfuls to one kerosene tin of water. Pour this on the chaff and mix it well into the feed. This will help to keep the cows in good order. To feed cows for the stock market soaked barley during the winter months will prove the best, with a liberal supply of chaff and green hay.

[*Papers Read at Conferences.*]

PIGS.

For weaners there is no feed that is easier to feed or better for pigs than skim milk and pollard. Do not feed too much at one time; if necessary, feed three times a day.

Farmers must give some consideration to the type of pig they are feeding, and if for pork, have the Berkshire or Mid York fed on crushed and soaked barley. If for bacon, it is essential to keep the pigs growing and do not let them get too fat. When about a month off marketing, feed small feeds three times a day. For this, house refuse, skim milk and soaked wheat give good results.

Do not overfeed the sow that is to farrow, and after the pigs are born, give only skim milk and bran for two days; then give plenty of good food.

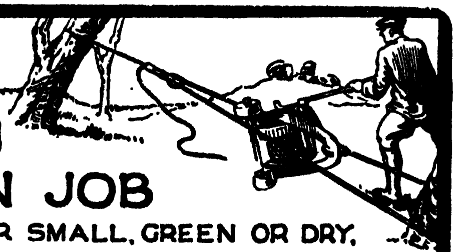
FARMING ON A MIXED FARM, AND IS MY PROFIT WHAT IT SHOULD BE?

[H. G. Fisher, Tatiara.]

When farm produce is low in price, like it has been for several years past, it is apparent to all that every effort should be made to get maximum returns for labour and capital expended.

Cropping Operations.—Are methods up to-date and carried out to the best of our ability, and are we sure the paddock to be fallowed for wheat is in a good fertile condition and capable of growing a good crop? If it is in a condition to grow a good crop, do we sow the best seed and the most suitable variety for our district, and also a good liberal dressing of super? If it is not in a condition to grow a crop, top dress it and leave it out to pasture, or, better still, sow Subterranean clover and Wimmera rye grass if the country is suitable for it. It would enrich the land, and if sheep were run on it the returns of their wool would be greater than the return from the ordinary crop of wheat we could expect from such a paddock. Another way to treat the paddock, if it could not be allowed to lie out of cereal growing so long, would be to grow oats, or a mixture of oats, Cape barley and rye for feeding-off purposes; it would help considerably to enrich the paddock.

Grow oats on land, if possible, before fallowing it for a wheat crop. Another cereal can be grown fairly cheaply in parts of our district—malting barley. The wheat stubbles can be burnt off and the land worked up and left until the wheat and oats have been sown. Barley does not need a long growing period, and it will generally show a fair profit on the expenditure outlaid. Local barley ripens earlier than lower down in the South-East, and it can be put on the Melbourne market when the maltsters are requiring it. I mentioned at the beginning of this paper, are our methods up-to-date? and I believe they may be on some farms a little overdone. Too many horses to do the work, and possibly a tractor lies idle a good part of the time. Are we trying to put in more crop than we should with the power that we have, and not working the soil as we should, which means reduced yields? Is the type of horse we breed the class that can do the work? When we have one or two to sell, are they the sort that the buyer is looking for? Apart from the profit, it gives one pleasure to see a good class of horse on the farm. Are our milking cows helping to keep us or are we keeping them? Some cows pay, others do not, and the writer is as guilty as anyone of having one or two that do not pay, but are we endeavouring to improve our herd? Good cows are as cheap now as they have been for a long time. A poor producer has to be milked and fed, which is time and money wasted, while a good cow pays for it.



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Several good sires have been brought to the district of late, thanks to their enterprising owners. Farmers would be well advised to use them and improve dairy herds and, incidentally, incomes.

Sheep are one of the most profitable animals on the farm. Are we carrying as many as we should, or have we too many which are running short of feed in the dry autumn, or do we hand feed them to keep up their condition.

What about those pieces of land unsuitable for cultivation on the farm? Have we cleared them up and top dressed and made the most possible use of them? In our district, with a good annual rainfall, some of the poorer class of country has become the most profitable with the sowing of clovers and grasses and the annual top dressing with super.

Departmental officers have often stressed the fact that top dressing of pastures well repays the landowners. Are we still keeping that fat pig that Mr. Barlow denounces, or are we keeping the lean type that brings the highest market rates?

TOBACCO GROWING IN MURRAY IRRIGATION AREAS.

[R. E. C. Giles, Tobacco Instructor.]

Leaf curing operations have commenced at Barmera, giving definite results as to the suitability of this locality for the production of bright, flue-cured tobacco.

Experimental plots of tobacco of 24 light varieties were established in various parts of the Irrigation Areas, between Renmark and Cobdogla, with the assistance of 10 landholders.

Adequate protection from high winds was obtained by means of strips of sunflowers and maize, which were well established before the tobacco was planted out in the fields.

A considerable amount of damage was done to crops during December and January last, by insect pests—cut worm, stem borer, and leaf miner—but growers overcame these difficulties and have succeeded in growing reasonably sound leaf.

The tobacco has remained free from all disease while in the field stage, despite an outbreak of blue mould in the seedbeds at the Berri Experimental Orchard in October last, which was brought under control by means of benzol fumes.

The nature of the soil has proved to be the deciding factor in these experiments. Crops grown on the light, ashy, Loveday sand are turning out remarkably good leaf.

Plants have grown well, the leaf is full of gum and of good texture, and is ripening in a normal manner, colouring commencing and spreading without any sign of deterioration in quality, which is, unfortunately, apparent in leaf grown on the heavier soils in the vicinity of Barmera and Cobdogla.

There are two varieties of tobacco, namely, Bonanza and White Stem Orinoco, which seem most suited to this area. The former variety has done well in recent years in the North Queensland tobacco-growing districts.

As much seed as possible will be harvested from the successful plots of tobacco grown by Messrs. H. Wilkinson and L. Kerley, at Loveday, to ensure an adequate supply for next season.

Good leaf has been grown upon white Murray sand at Berri and Lyrup, but not upon a sufficiently large scale to justify a definite expression of opinion as yet.

The sandhills formed by drift at Barmera and Loveday have given poor results, despite heavy waterings and applications of fertiliser, and do not appear to warrant any further experiment.

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
B. Cooke, Kanmantoo.	1	109	
	2	146	
	3	197	452
	4	186	
	5	232	
	6	209	627
			1,079
	7	—	
	8	—	
	9	—	—
	10	—	
	11	—	
	12	—	—
			—
A. H. Matthews, Bridgewater	13	209	
	14	—	
	15	196	405
	16	221	
	17	188	
	18	89	498
			903
H. F. Muirson, Yundi.	19	dead	
	20	179	
	21	90	269
	22	163	
	23	216	
	24	58	437
			706
R. McKee, 5, Rose Street, Carrondown.	25	190	
	26	dead	
	27	234	424
	28	231	
	29	209	
	30	225	665
			1,089
H. C. Stacy, Meadows.	31	93	
	32	122	
	33	198	403
	34	92	
	35	197	
	36	247	536
			939
T. Cleaver, Bridgewater.	37	140	
	38	177	
	39	94	411
	40	196	
	41	172	
	42	189	557
			968
C. Sandstrom, Yundi.	43	202	
	44	dead	
	45	dead	202
	46	88	
	47	122	
	48	162	372
			574
A. J. Monkhouse, Woodside.	49	88	
	50	179	
	51	220	487
	52	243	
	53	136	
	54	223	602
			1,089
J. F. Smith, Meadows.	55	187	
	56	150	
	57	10	347
	58	171	
	59	71	
	60	204	446
			793
A. Young, Bridgewater.	61	199	
	62	203	
	63	181	583
	64	187	
	65	229	
	66	180	546
			1,129
R. W. McAlister, Yundi.	67	117	
	68	182	
	69	177	476
	70	162	
	71	107	
	72	205	474
			950
T. Duhring, Mallala.	73	233	
	74	dead	
	75	169	402
	76	99	
	77	100	
	78	132	331
			733
R. J. Underdown, Meadows.	79	66	
	80	127	
	81	195	388
	82	168	
	83	143	
	84	216	527
			915
S. Hill, Bridgewater.	85	176	
	86	222	
	87	169	567
	88	225	
	89	227	
	90	193	645
			1,212
W. R. Hedger, Yundi.	91	188	
	92	177	
	93	202	517
	94	176	
	95	146	
	96	194	516
			1,033

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
Langmaid & Bettison, Salisbury.	97	177	
	98	65	
	99	118	360
	100	196	
	101	79	
	102	7	282
			642
E. Portlock, Meadows.	103	229	
	104	205	
	105	208	642
	106	174	
	107	154	
	108	191	519
			1,161
Murray Powell, Jupiter Creek.	109	218	
	110	47	
	111	218	483
	112	192	
	113	202	
	114	49	443
			926
G. W. Bignell, Meadows.	115	214	
	116	178	
	117	166	558
	118	104	
	119	200	
	120	199	503
			1,061
W. M. Field, Yundi.	121	204	
	122	37	
	123	169	410
	124	132	
	125	66	
	126	164	362
			772
C. R. Wharton, Meadows.	127	203	
	128	214	
	129	234	651
	130	226	
	131	204	
	132	151	581
			1,232
H. H. Hefford, Murray Bridge.	133	191	
	134	204	
	135	209	604
	136	99	
	137	206	
	138	126	431
			1,035
F. W. Gage, Meadows.	139	191	
	140	5	
	141	dead	196
	142	187	
	143	183	
	144	134	504
			700
W. H. L. Norman, Echunga.	145	77	
	146	64	
	147	dead	141
	148	233	
	149	199	
	150	128	560
			701

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
B. R. Whittington, Yundi.	151	157	
	152	115	
	153	190	462
	154	214	
	155	169	
	156	188	571
			1,033
B. C. Sanders, Meadows.	157	201	
	158	216	
	159	234	651
	160	206	
	161	140	
	162	dead	346
			997
H. H. Gallagher, Pooraka.	163	90	
	164	dead	
	165	201	291
	166	169	
	167	106	
	168	222	497
			788
W. Sickert, Meadows.	169	230	
	170	144	
	171	237	611
	172	181	
	173	152	
	174	157	490
			1,101
W. Restall, Echunga.	175	108	
	176	1	
	177	158	267
	178	198	
	179	182	
	180	125	505
			772
A. G. Dawes, 230, Portrush Road, Glenunga.	181	227	
	182	169	
	183	187	583
	184	161	
	185	dead	
	186	213	374
			957
G. W. Sykes, Yundi.	187	192	
	188	95	
	189	132	419
	190	182	
	191	176	
	192	209	567
			986
R. Bartley, Meadows.	193	128	
	194	233	
	195	201	562
	196	146	
	197	190	
	198	195	531
			1,093
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury.	199	123	
	200	188	
	201	108	419
	202	183	
	203	96	
	204	121	400
			819

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
J. J. Devlin, Meadows.	205	176	
	206	204	
	207	245	625
	208	197	
	209	180	
	210	235	612
			1,237
D. J. Foxwell, Echunga.	211	dead	
	212	193	
	213	47	246
	214	26	
	215	206	
	216	100	332
			572
F. J. Buck, Meadows.	217	dead	
	218	211	
	219	210	421
	220	101	
	221	165	
	222	125	391
			812
J. A. Grist, Yundi.	223	73	
	224	132	
	225	173	378
	226	78	
	227	dead	
	228	171	249
			627
L. A. King, Meadows.	229	184	
	230	200	
	231	dead	384
	232	83	
	233	dead	
	234	dead	83
			467
R. W. Sando, Echunga.	235	142	
	236	90	
	237	96	328
	238	134	
	239	127	
	240	149	412
			740
E. W. Young, Meadows.	241	184	
	242	139	
	243	193	516
	244	191	
	245	—	
	246	98	289
			805
A. Jarvis, Yundi.	247	206	
	248	119	
	249	177	502
	250	209	
	251	159	
	252	246	614
			1,116
	253	—	
	254	—	
	255	—	—
	256	—	
	257	—	
	258	—	—
			—
S. Bridge, Yundi.	259	215	
	260	227	
	261	193	635
	262	134	
	263	170	
	264	172	476
			1,111
H. G. Egarr, Meadows.	265	180	
	266	97	
	267	dead	277
	268	24	
	269	141	
	270	dead	165
			442
R. H. Smith, Yundi.	271	211	
	272	189	
	273	217	617
	274	221	
	275	52	
	276	214	487
			1,104
J. M. Lawson, Meadows.	277	218	
	278	221	
	279	167	606
	280	145	
	281	194	
	282	83	422
			1,028
J. O. Marshall, Yundi.	283	35	
	284	206	
	285	212	453
	286	174	
	287	204	
	288	82	460
			913
G. Joyce, Meadows.	289	dead	
	290	239	
	291	95	334
	292	109	
	293	226	
	294	179	514
			848
J. A. Bradtke, Yongala.	295	14	
	296	dead	
	297	196	
		210	
W. H. A. Hodgson, Salisbury.	298	169	
	299	215	
	300	216	
		600	
A. W. McDonald, Gawler.	301	67	
	302	181	
	303	200	
		448	
J. H. Dowling, Glossop.	304	162	
	305	148	
	306	22	
		332	

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
A. P. Urlwin, **Balaklava.**	307	152	
	308	145	
	309	25	
		322	
L. S. Ekers, **Mount Compass.**	310	188	
	311	69	
	312	191	
		448	
V. E. Williams, **Semaphore Park.**	313	229	
	314	227	
	315	233	
		689	
F. P. Munzberg, **Tanunda.**	316	223	
	317	179	
	318	224	
		626	
Total Class 1		46,385	

Class 2—Any Other Light Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
Langmaid & Bettison, **Salisbury.** **(Black Minorcas.)**	319	122	
	320	82	
	321	188	
		392	
A. Heaysman, **Government Road,** **Eden Hills.** **(Cuckoo Leghorns.)**	322	184	
	323	224	
	324	148	
		556	
Total Class No. 2.		948	

Class No. 3—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
A. G. Dawes, 230, **Portrush Road,** **Glenunga.**	325	58	
	326	31	
	327	174	263
	328	164	
	329	147	
	330	194	505
			768
H. J. Mills, **108, Edward Street,** **Edwardstown.**	331	202	
	332	176	
	333	178	556
	334	178	
	335	213	
	336	dead	391
			947
K. Pennack, **Pooraka.**	337	173	
	338	147	
	339	85	405
	340	233	
	341	77	
	342	161	471
			876
H. H. Gallagher, **Pooraka.**	343	160	
	344	152	
	345	165	477
	346	157	
	347	143	
	348	50	350
			827
B. Cooke, **Kanmantoo.**	349	47	
	350	84	
	351	55	
		186	
H. H. Hefford, **Murray Bridge.**	352	157	
	353	123	
	354	84	
		364	
J. H. Dowling, **Glossop.**	355	153	
	356	60	
	357	163	
		376	
L. S. Ekers, **Mount Compass.**	358	170	
	359	107	
	360	176	
		453	
A. G. Dawes, **230, Portrush Road,** **Glenunga.**	452	111	
	453	124	
	454	147	382
	455	78	
	456	185	
	457	192	455
			837
A. P. Urlwin, **Balaklava.**	465	140	
	466	207	
	467	139	
		486	
Total Class No. 3		6,120	

Class No. 4.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
H. J. Mills, **108, Edward Street,** **Edwardstown.** **(Rhode Island Reds.)**	361	3	
	362	dead	
	363	91	94
	364	218	
	365	99	
	366	dead	317
			411
A. G. Dawes, **230, Portrush Road,** **Glenunga.** **(Rhode Island Reds.)**	367	96	
	368	146	
	369	89	331
	370	182	
	371	102	
	372	167	451
			782
F. F. Welford, **1, Ludgate Circus,** **Colonel Light Gardens.** **(Rhode Island Reds.)**	373	174	
	374	193	
	375	dead	367
	376	75	
	377	174	
	378	161	410
			777
V. F. Gameau, **Findon Road,** **Woodville.** **(Rhode Island Reds.)**	379	72	
	380	175	
	381	155	402
	382	119	
	383	25	
	384	79	223
			625

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
K. Pennack, Pooraka. (Barnevelders.)	385	189	
	386	122	
	387	150	461
	388	183	
	389	190	
	390	165	538
			999
A. G. Dawes, 220, Portrush Road, Glenunga. (Rhode Island Reds.)	458	19	
	459	116	
	460	152	287
	461	15	
	462	177	
	463	146	338
			625
Total Class No. 4			4,219

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.	
G. R. Cowell, Balhannah.	391	195	
	392	111	
	393	dead	306
	394	106	
	395	75	
	396	138	319
			625
A. J. Monkhouse, Woodside.	397	43	
	398	208	
	399	182	433
	400	133	
	401	196	
	402	191	520
			953
G. R. Cowell, Balhannah.	403	179	
	404	188	
	405	80	447
	406	185	
	407	112	
	408	dead	297
			744
Total Class No. 5			6,541

Class No. 7.—Black Orpingtons.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.
W. R. Christie, Upper Mitcham.	409	157
	410	141
	411	133
		431
Total Class No. 7		431

Class No. 8.—Any Other Heavy Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.
W. R. Christie, Upper Mitcham. (Rhode Island Reds.)	412	169
	413	77
	414	144
		390
Total Class No. 8		390

SECTION 3.—WET MASH.

Home Project Utility Section.—Any Breed.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.
Peter Western, Ascot Park School. (White Leghorn.)	415	234
Peter Western, Ascot Park School. (White Leghorn.)	416	225
William Sando, Echunga School. (White Leghorn.)	417	205
Douglas Marshall, Yundi School. (White Leghorn.)	418	204
Norman Page, Murray Bridge School. (White Leghorn.)	419	203
Kelvyn & Brian Nicholls, Finniss School. (White Leghorn.)	420	132
Dean Colwell, Grange School (White Leghorn.)	421	160
Warren Hannaford, Paracombe School (White Leghorn.)	422	226
W. Horne, Woodville School. (White Leghorn.)	423	dead
Owen Robinson, Ascot Park School. (White Leghorn.)	424	173
June Chapman, Woodchester School. (White Leghorn.)	425	191
Rosa Hunt, Morphett Vale School. (White Leghorn.)	426	111
Jack O'Sullivan, Morphett Vale School. (White Leghorn.)	427	133
Peter Taylor, Morphett Vale School. (White Leghorn.)	428	80
James Taylor, Morphett Vale School. (White Leghorn.)	429	211
William Gregory, Victor Harbour School. (White Leghorn.)	430	179
Ian Bruce, McLaren Flat School. (White Leghorn.)	431	161
Clifford Burford, Smithfield School. (White Leghorn.)	432	134
Tom Callaghan, Smithfield School. (White Leghorn.)	433	61
Eric Pratt, Abattoirs School. (White Leghorn.)	434	240
Stanley Pratt, Abattoirs School. (White Leghorn.)	435	213
Alan Yelland, Cunliffe School. (Minorca.)	436	115
Gordon Gallasch, Gilles Plains School. (White Leghorn.)	437	224

EGG-LAYING COMPETITION—*Continued.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 31st Mar., 1936.
Clarence King, Tarlee School. (White Leghorn.)	**438**	95
Olive Pitman, Gilles Plains School. (Black Orpington.)	**439**	128
Donald Heading, Sturt School. (Black Orpington.)	**440**	175
Olive Steer, Sturt School. (Black Orpington.)	**441**	177
Herbert Oliver, McLaren Vale School. (Black Orpington.)	**442**	204
Lyol Stone, Morphett Vale School. (Black Orpington.)	**443**	dead
Ray Candy, Noarlunga School. (Black Orpington.)	**444**	83
Malcolm Booth, Bridgewater School. (Black Orpington.)	**445**	189
Murray Heneker and Frank Short, Hamley Bridge School. (Black Orpington.)	**446**	176
Peter Boucaut, Seaton Park School. (Rhode Island Red.)	**447**	53
Peter Preece, Gilles Plains School. (Rhode Island Red.)	**448**	72
Cliff Crosser, Wellington Road School. (White Leghorn.)	**449**	151
John Keldoulis, Orroroo School. (Black Orpington.)	**450**	192
Bruce Dooland, Thebarton School. (Black Orpington.)	**451**	171
Alan Yelland, Cunliffe School. (Rhode Island Red.)	**464**	123
Total		5,804

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36, CONDUCTED AT PARAFIELD POULTRY STATION.

FINAL LEADING SCORES.—FIRST GRADE EGGS ONLY.

SECTION I.—WET MASH.

Class 1.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
H. C. Stacy	247	36
A. Jarvis	246	252
J. J. Devlin	245	207
Trios—		
V. E. Williams	689	313–315
E. McKee	665	28–30
B. C. Sanders	651	157–159
C. R. Wharton	651	127–129
Teams—		
J. J. Devlin	1,237	205–210
C. R. Wharton	1,232	127–132
S. Hill	1,212	85–90

Class 2.—*Any other Light Breed.*

Singles—		
A. Heaysman (Cuckoo Leghorn)	224	323
Langmaid and Bettison (Black Minorca)	188	321
A. Heaysman (Cuckoo Leghorn)	184	322

Class 3.—*Black Orpingtons.*

Singles—		
K. Pennack	233	340
H. J. Mills	213	335
A. P. Urlwin	207	466
Trios—		
H. J. Mills	556	331–333
A. G. Dawes	505	328–330
A. P. Urlwin	486	465–467
Teams—		
H. J. Mills (only 5 birds)	947	331–336
K. Pennack	876	337–342
A. G. Dawes	837	452–457

Class 4.—*Any other Heavy Breed.*

Singles—		
H. J. Mills (Rhode Island Red)	218	364
F. F. Welford (Rhode Island Red)	193	374
K. Pennack (Barnvelders)	190	389

Class 4.—Any other Heavy Breeds—continued.

	Eggs laid.	Bird Nos.
Trios—		
K. Pennack (Barnevelders)	538	388–390
K. Pennack (Barnevelders)	461	385–387
A. G. Dawes (Rhode Island Reds)	451	370–372
Teams—		
K. Pennack (Barnevelders)	999	385–390
A. G. Dawes (Rhode Island Reds)	782	367–372
F. F. Welford (Rhode Island Reds, only 5 birds)	777	373–378

SECTION II.—DRY MASH.

Class 5.—White Leghorns.

Singles—		
A. J. Monkhouse	208	398
A. J. Monkhouse	196	401
Trios—		
A. J. Monkhouse	520	400–402
G. R. Cowell	447	403–405
Teams—		
A. J. Monkhouse	953	397–402
G. R. Cowell (only 5 birds)	744	403–408

Class 7.—Black Orpingtons.

Singles—		
W. R. Christie	157	409

Class 8.—Any other Heavy Breed.

W. R. Christie (Rhode Island Red)	169	412

SECTION III.—WET MASH.

Eric Pratt, Abattoirs (White Leghorn)	240	434
Peter Western, Ascot Park (White Leghorn)	234	415
Warren Hannaford, Paracombe (White Leghorn)	226	422
Peter Western, Ascot Park (White Leghorn)	225	416
Gordon Gallasch, Gilles Plains (White Leghorn)	224	437
Stanley Pratt, Abattoirs (White Leghorn)	213	435

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April, 1935, to 31st March, 1936.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal; 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 29th February, 1936.	No. Eggs Laid Month of March, 1936.	Total Eggs Laid 1st April, 1935, to 31st March 1936.
No. 1 Test	6,877	573	7,450
No. 2 Test	7,022	547	7,569
No. 3 Test	7,439	691	8,130
No. 4 Test	6,103	556	6,659
No. 5 Test	6,159	604	6,763

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1936.

Eggs for Hatching and Day Old Chickens

WHITE LEGHORNS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30s. per 100.

DAY OLD CHICKENS.—15s. per dozen; £3 10s. in lots of 100.

BLACK ORPINGTONS.

EGGS.—10s. per Setting of 15 Eggs. Incubator Lots, £2 per 100.

DAY OLD CHICKENS.—17s. 6d. per dozen ; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, 30s. per 100.

DAY OLD CHICKENS.—15s. per dozen; £3 10s. in lots of 100.

Free on Rail, Salisbury. **DELIVERY.—CHICKS—January to March.**
EGGS—January to February.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2oz., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

THE "HOME" TRAIN.

Work over for the day, man and maid, young and old are intent upon "getting home." All day they have been concerned with business, mostly someone else's business, for the majority of the homeward-bound travellers are salary or wage earners.

Have they—have you—found time for personal business.

The Commonwealth Savings Bank is open all day in City, Town, Village and Country Post Office, and its convenient services are therefore easily available to all.

Opening a Savings Bank account—and using it—costs little time and no money, and it will pay you well in the long run.

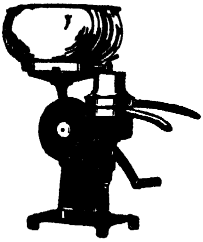
Commonwealth Savings Bank of Australia

(Guaranteed by the Commonwealth Government.)

There is only One Best SEPARATOR

THE

"ALFA LAVAL"



Holds the World's Record for Clean Skimming

Rustless Metal Bowl and Discs.

AWARDED FIRST PRIZE
Royal Agricultural Society's Show, 1935.

Allowance made for old Separator, and balance on easy terms.

A. W. SANDFORD & Co., Limited,
Grenfell Street, Adelaide.

It is to the interest of every Farmer to belong to the AGRICULTURAL BUREAU.

Join the nearest Branch, or if you are not within driving distance of the nearest branch write to the General Secretary, Central Agricultural Bureau, for particulars as to how to form a Branch.

WOMEN interested in Agriculture should join a Woman's Branch. Full particulars on application.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE AT BEETALOO VALLEY, 12th MARCH.

Opened by the Hon. A. P. Blesing, M.L.C. (Minister of Agriculture), the Conference of Mid-Northern Branches of the Agricultural Bureau was held for the first time at Beetaloo Valley, on Thursday, 12th March. In addition to officers of the Department of Agriculture, there was an excellent attendance of delegates from district branches of the Bureau. Mr. P. Curtin presided, and the following papers were read and discussed:—"A History of Beetaloo Valley," by Mr. J. Arthur, Beetaloo Valley; and "Pea Growing," by Mr. W. F. Wurst, Laura.

Conference decided "That the Bush Fires Act be amended to permit of stubble burning being carried on between the hours of 9 a.m. and sunset." "That the 1937 Conference be held at Koolunga." "That the points awarded for 'apparent yield' in crop competitions be reduced to 30 and the points for 'trueness to type' increased to 20."

The Hon. A. L. McEwin, M.L.C. (Chairman of the Advisory Board of Agriculture), presented the prizes to the successful competitors in the Northern Crop Competitions.

In the evening, Mr. Spafford gave an address, illustrated with lantern slides, on "A Tour of the Southern Hemisphere."

CONFERENCE AT BORDERTOWN.

The Conference of South-Eastern Branches of the Agricultural Bureau, which was held at Bordertown on 1st April, was sponsored by the Tatiara Branch, and the three sessions (morning, afternoon, and evening) were presided over respectively by Messrs. F. Densley (Tatiara), G. D. Butler (Wolseley), and H. Warland (Mundalla). The Conference was opened by Professor Perkins (Director of Agriculture) representing the Advisory Board of Agriculture, and papers were read by Mr. H. G. Fisher (Tatiara) on "Farming on a Mixed Farm" and Mr. A. E. Milne (Tatiara) on "General Feeding of Stock." Mr. C. T. McKenna, B.V.Sc. (Veterinary Officer, Stock and Brands Department), addressed the Conference on Parasites Attacking Farm Stock, and Mr. C. A. Goddard (Assistant Wool Instructor, School of Mines) also gave an address on the Classing and Marketing of Wool. Officers of the Department of Agriculture assisted in discussions and replied to a large number of questions submitted by members of branches.

The evening session was devoted to an address (illustrated by lantern slides) by Mr. W. J. Spafford (Deputy Director of Agriculture) on "A Tour of the Southern Hemisphere."

It was decided to hold the next Conference at Bordertown. Other resolutions carried were: "That a sheep expert be appointed for South Australia" and "That time for burning under the Bush Fires Act be not altered in any way because of the great danger of fires getting out of control and doing a lot of damage if burning is done at an earlier hour than allowed at present."

CONFERENCE AT KYBYBOLITE.

Branches of the Agricultural Bureau situated in the Lower South-East held their Annual Conference on 8th April for the first time at Kybybolite. Mr. J. M. Wray occupied the chair, and the opening address was delivered by Mr. P. J. Baily (Member, Advisory Board of Agriculture).

Mr. L. J. Cook (Manager of the Kybybolite Experimental Farm) read a paper on "A Comparison of Results of Wimmera Rye Grass and *Phalaris tuberosa*," and Mr. E. C. H. Schinckel gave a historical outline of the Kybybolite Farm, and urged an extension of its scope of operations.

Addresses were delivered by Mr. A. C. H. Richardson (Chairman of the Unemployment Relief Council) in which he outlined a scheme to assist producers to clear land, and Mr. R. C. Scott (Supervisor of Experimental Work) who spoke on his recent tour of New Zealand.

At the session devoted to Free Parliament it was decided:—"That the 1937 Conference should be held at Coonawarra"; "That this Conference recommends to the Government that steps be taken to augment the scope of work of Kybybolite Farm in such a way as to make it a National Research Farm"; "That the Department of Agriculture take over the offices of veterinary surgeons in South Australia, and that a veterinary surgeon be appointed for the South-East"; "That a sheep expert be attached to the Department of Agriculture for the benefit of farmers of the State."

On behalf of the Advisory Board, Mr. Baily presented Life Membership Certificates of the Agricultural Bureau to Messrs. L. S. Davie and L. J. Cook.

The evening session was devoted to an address by Mr. W. J. Spafford (Deputy Director of Agriculture), "A Tour of the Southern Hemisphere."

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, 25th March, 1936, there being present:—Hon. A. L. McEwin, M.L.C. (Chairman), Messrs. A. M. Dawkins, S. Shepherd, J. B. Murdoch, Geo. Jeffrey, F. Coleman, H. N. Wicks, R. H. Martin, Dr. A. E. V. Richardson, Prof. A. J. Perkins, and H. C. Pritchard (Secretary). Apologies were received from Messrs. P. J. Baily and A. J. Cooke.

Blackwood Experimental Orchard.—Mr. H. N. Wicks presented a statement regarding the reorganisation of the work being conducted by the Blackwood Experimental Orchard. The Board suggested certain additions, and asked that the report be presented again at the next meeting.

Oenological Course at Roseworthy College.—The Secretary reported that the Government had approved of an advanced course in Wine Making at the Roseworthy Agricultural College.

Crop Competitions.—Lower North Conference resolution:—"That when a crop is grown on the share system, the following provisions in relation to prizes shall apply: A joint entry may be made, and any prize won be divided between the owner farmer and the share farmer, unless either party refuses to share in the cost of the entry, when the entry may be made separately by the owner farmer or share farmer—any prize to go to the party making the entry."

Decided to endorse the resolution and to transmit it to the Crop Competition Committee for consideration.

Crop Competitions.—Mid-North Conference resolution:—"That the points awarded for 'apparent yield' in Crop Competitions be reduced to 30, and the points for 'trueness to type' increased to 20."

Decided to forward the resolution to the Crop Competition Committee for consideration.

New Branches.—Approval was given to the formation of Women's Branches at Echunga and Strathalbyn.

Life Members.—Approval was given for the addition of the following names to the roll of Life Members:—Messrs. H. C. Roediger, A. E. A. Skipworth, W. D. Wemyss (Yeelanna), J. A. Lane, J. P. Burchard (Tantanoola), A. Bradley, L. S. Davie (Kybybolite), J. M. Cheriton (Strathalbyn).

New Members.—The names of the following persons were added to the rolls of existing Branches:—Arthurton—H. R. Lamshed, Howard Bowman; Beetaloo Valley Women's—Miss R. Andrew; Blackwood—C. F. Scheror, W. N. Halstead, J. Austin Lambert; Boor's Plains Women's.—Mrs. P. Vidal, Miss L. Lamshed; Brentwood—R. Wilson; Clarendon—Ron. Sowerby, E. Gould; Coonawarra Women's—Mrs. W. Davis; Currency Creek—W. W. Ellis; Echunga—J. Christinger, A. W. Mooney; Goode—C. Lutz; Hartley—B. H. Wagenknacht; Hope Forest—Gleeson DeCaux; Karte—L. Fiebig, Gordon Atze, H. Gale; Kybybolite—W. Davie; Kybybolite Women's—Miss C. M. Johnson; Maltee Women's—Miss D. Edson, Miss N. Schwarz, Miss D. Bassham; Mount Gambier—M. Kilsby; Mundalla Women's—Miss D. Menzie, Mrs. Ray Hinge; Mypolonga—G. Llewellyn; Narridy—John Renshaw; Parilla Women's—Mrs. H. Schumann; Parrakie—W. Watts, Albert Edwards, Ernest Wheare, Eric Ross, O Heinzel, A. D. Sanderson, N. Catford; Redhill—Jack Morgan, Glen Crouch, Jack Miller; Rosedale—Garth Atkin, Frederick C. Wilson, Claude A. Gwynne; Roseworthy—C. Brooks; Saddleworth Women's—Mrs. J. D. Garrett; Sheoak Log Women's—Mrs. B. Window, Mrs. G. Heinjus; Snowtown—J. F. Kelly; Tantanoola— — Blowes; Wandearah—Arnold Eagle; Wasleys Women's—Mrs. — Hannan, Miss G. George: Wirrabara Women's—Mrs. Annie Edwards; Yandiah Women's—Mrs. A. Francis, Miss A. Kupke, Miss D. Borgas; Yeelanna—A. Doley, N. Glover.

Foundation Members of New Branches.—Echunga Women's—Mrs. G. Edmonds, Mrs. P. Duffield, Mrs. F. Wickham, Mrs. A. Hauber, Mrs. E. J. Dennis, Mrs. A. J. Feder, Mrs. T. E. Hincks, Mrs. C. McDonald, Mrs. W. H. L. Norman, Mrs. E. Liebelt, Miss P. Henderson, Mrs. J. Boon, Mrs. B. Plane, Mrs. R. Davis, Mrs. H. Smith, Miss — Hough, Mrs. H. Gilbert, Mrs. A. Golding, Mrs. A. W. Mooney; Strathalbyn Women's—Mrs. A. S. Deer, Mrs. S. S. Arnold, Mrs. C. M. Hudd, Mrs. J. M. Hudd, Mrs. R. Aworth, Mrs. L. J. Hall, Mrs. F. W. Allison, Mrs. L. E. Stirling, Mrs. G. Sissons, Mrs. K. R. Westley, Mrs. J. Collett, Mrs. R. G. Martin, Mrs. J. Bowden, Miss O. Bottrill, Miss O. Westley, Miss D. Sissons.

Conferences.—The Secretary reported that Conferences would be held at Bordertown on April 1st, and at Kybybolite on April 8th.

Change of Branch Name.—The name of the Tweedvale Branch was altered to Lobethal.

Several items were taken in Committee.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on 1st April, 1936:—

BUTTER.—A seasonal shrinkage in supplies continued throughout March, particularly in top grade, and producers are now anxiously awaiting the break in the season to check the downward trend. The demand for choicest quality was strongly maintained, and a hardening in prices was recorded. The London butter market, after sagging badly because of the difficult European situation, has shown improvement, and prices there firmed 4s. to 5s. per cwt. There is still a surplus of lower grades to go forward, and it seems probable that there will be no break in the continuity of shipments this year. Present prices in Adelaide are:—Choicest creamery fresh butter in bulk, 1s. 4½d. per lb. Prints and delivery extra. (This price is for local sale only, and under the quota system the equalised price manufacturers will receive will be 1s. 9/16d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines from 1s. to 1s. 1d. per lb. for choicest; stores, 8d. to 9d. per lb. (These prices are subject to equalisation levies.)

CHEESE.—In the South-East, where most of this commodity is manufactured, conditions have rapidly altered so that the supplies of cheese are now much less than a month or two ago. Exporting was continued throughout March, but is now about finished. London buyers have been well satisfied with the quality of the South Australian article so that there has been no difficulty in quitting stocks from time to time. Local prices are:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. to 1s. 1d. per lb.

EGGS.—Supplies are now falling away very rapidly, and with stronger local and Interstate demand values are likely to go higher, especially when the cool weather sets in. Present rates are:—Ordinary country eggs, fair average quality, from 7d. per doz. net; selected new laid, clean eggs, full-sized, to 1s. per doz. net.

BACON.—The demand for the established brands of bacon was well maintained, and the turnover was better than usual for this time of the year. Curers have ample stocks which are being placed on the markets from day to day, and no difficulty was experienced in supplying the demands. Hams have been somewhat slow of sale, and Interstate orders were necessary to reduce stocks. Values are:—Best quality sides, 9d. to 9½d. per lb.; middles, 9½d.; heavy middles, 8d. to 8½d.; rolls, 8d. to 8½d.; hams, 11½d. to 1s.; cooked, 1s. 2d. to 1s. 2½d. per lb.; lard, bulk, 5½d. to 6d.; prints, 6½d. to 7d. per lb.

ALMONDS.—The supplies of the new crop are now arriving in much greater quantities each week, and turnover was well maintained, present quotations being:—Softshells and Brandis, 8½d. to 9d.; hardshells, 5d. to 5½d.; kernels, 1s. 9½d. to 1s. 10½d. per lb.

HONEY.—No alteration was made in prices throughout the month although in some instances concessions were given to effect sales. Stocks held by merchants are still very heavy, but it is to be hoped that during the winter these will be reduced. Quotations area:—Prime quality clear extracted, 2d. to 2½d.; lower grades, 1d to 2d. per lb.

BEESWAX.—Has been short in supply for the last few weeks, and heavier quantities could be placed at:—1s. 2d. to 1s. 2½d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our salerooms, which are in every way the best equipped in the State. The demand for all classes of birds was steadily maintained, but prime, heavyweight stock met with the keenest interest, as poulterers were purchasing for their Easter requirements and having the birds placed away in cold stores. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. to 4s.; nice-conditioned cockerels, 2s. 6d. to 2s. 11d.; fair-conditioned cockerels, 1s. 9d. to 2s. 4d.; chickens, lower; heavyweight hens, 2s. 3d. to 3s.; medium hens, 1s. 8d. to 2s.; light hens, 1s. to 1s. 5d.; couple of pens of weedy sorts, lower; prime young muscovy drakes, 3s. to 3s. 8d.; young muscovy ducks, 1s. 9d. to 2s. 3d.; ordinary ducks, 1s. to 1s. 9d.; ducklings, lower; geese, 2s. to 3s. 6d.; goslings, lower; turkeys, good to prime condition, 8d. to 9½d. per lb. live weight; turkeys, fair condition, 6d. to 7½d. per lb. live weight; turkeys, poor and crooked breasted, lower; pigeons, 3d. each.

POTATOES.—New season's, 8s. 6d. per cwt.

ONIONS.—Brown Spanish, 8s. per cwt.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING JANUARY AND FEBRUARY, 1936.

IMPORTS.

Interstate.

	Jan.	Feb.		Jan.	Feb.
Apples (bushels)	29	202	Bulbs (packages)	34	80
Bananas (bushels)	16,520	15,844½	Plants, ornamental (pkgs.)	157	26
Cherries (bushel)	1	—	Seeds (packages)	37	48
Citrus—			Wine casks (No.)	3,094	3,356
Grape fruit (bushels)	109	76			
Lemons (bushels)	—	5	*Fumigated—*		
Oranges (bushels)	102	114	Citrus—Grape fruit	99	66
*Grapes (bushel)	1	—	Oranges	100	—
Mixed fruit (bushels)	5	—	Wine casks (No.)	33	61
Passion fruit (bushels)	51	5			
Peaches (bushels)	29	19	*Rejected—*		
Pineapples (bushels)	250	790	Apples (bushels)	16	—
Tomatoes (bushels)	—	36	Bananas (bushels)	52½	31½
Peanuts (bags)	194	38	Cherries (bushel)	1	—
Peanut kernels (bags)	38	42	Grapes (bushel)	1	—
Onions (bags)	—	182	Pineapples (bushels)	—	3
Potatoes (bags)	—	1,030			

* Prohibited Import.

Overseas.

(State Law.)

Wine casks (No.)	3,099	2,929	*Fumigated*—Wine casks (No.)	74	68

Federal Quarantine Act.

	Packages.	Lbs.	Packages.	Lbs.
Seeds, &c.	13,818	2,454,866	1,687	330,067
Canes	284	—	58	—
Chests, cocoanut	130	—	596	—
Chests, tea	4,522	—	1,852	—
Handles	310	—	707	—
		No.		No.
Plants	7	399	5	948
Timber	173,517	868,404 Sup. ft.	227,458	5,990,161 Sup. ft.

EXPORTS.

Federal Commerce Act.

		Jan. Pkgs.	Feb. Pkgs.			Jan. Pkgs.	Feb. Pkgs.
Aden	Apples	—	180	London	Apples	—	40,988
Batavia	Apples	—	10	Malta	Apples	—	50
	Potatoes	—	10	New Zealand	Seed, Clover	56	538
	Other vegetables	—	35	Penang	Other vegetables	—	5
Bombay	Pears	—	25	Singapore	Peaches	—	22
Colombo	Apples	869	1,862		Pears	—	73
	Plums	25	—		Plums	—	18
Glasgow	Apples	—	11,651		Other vegetables	—	40
Hamburg	Apples	—	17,648	Sourabeya	Apples	—	28
Helsinki	Apples	—	1,300		Pears	—	50
Hull	Apples	—	6,575		Plums	—	48
Liverpool	Apples	—	7,225		Other vegetables	—	1

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of March, 1936, and also the average precipitation for March, and the average annual rainfall.

Station.	Mar. 1936.	Av'ge. for Mar.	To end Mar. 1936.	Av'ge. Annual Rain-fall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta ..	0·50	0·45	1·43	4·62
Marree	0·2	0·54	0·71	5·83
Farina	0·8	0·67	0·81	6·37
Copley	0·11	0·71	1·31	7·85
Beltana.......	0·16	0·71	2·07	8·47
Blinman	0·30	0·78	2·01	11·81
Hookina	—	0·68	2·80	11·18
Hawker	0·12	0·61	1·90	12·2
Wilson	0·22	0·59	3·47	11·77
Gordon	0·20	0·73	1·86	10·46
Quorn	0·5	0·59	1·90	13·15
Port Augusta..	0·5	0·71	2·94	9·40
Bruce	—	0·69	4·81	9·74
Hammond	0·37	0·66	3·03	11·11
Wilmington ..	—	0·79	3·17	17·28
Willowie	0·11	0·74	2·67	12·22
Melrose	0·3	1·06	3·04	22·85
Booleroo Centre	0·8	0·66	2·13	15·21
Port Germein .	—	0·74	2·11	12·53
Wirrabara	—	0·94	1·26	19·25
Appila........	0·25	0·87	2·50	14·62
Cradock	0·15	0·58	1·86	10·78
Carrieton	0·13	0·58	2·42	12·19
Johnburg	0·19	0·55	2·77	10·56
Eurelia	0·59	0·60	3·33	12·76
Orroroo.......	0·90	0·63	3·01	13·20
Nackara	0·19	0·83	8·40	11·09
Black Rock ...	0·95	0·69	3·81	12·35
Oodlawirra ...	0·77	0·72	3·83	11·67
Peterborough..	0·23	0·71	3·33	13·22
Yongala	0·34	0·66	4·12	14·43
NORTH-EAST.				
Yunta	0·16	0·58	1·95	8·84
Waukaringa ..	0·11	0·59	2·14	7·89
Mannahill	0·17	0·53	1·25	8·16
Cockburn	0·11	0·49	2·22	7·91
Broken Hill ..	0·9	0·63	2·08	9·50
LOWER NORTH.				
Port Pirie	—	0·81	4·17	13·19
Port Broughton	0·23	0·60	1·79	13·85
Bute	0·17	0·65	3·33	15·39
Laura	—	0·84	3·64	17·97
Caltowie	0·37	0·82	2·77	16·76
Jamestown....	0·38	0·85	3·07	17·72
Gladstone	—	0·72	2·06	16·32
Crystal Brook .	—	0·69	2·95	15·76
Georgetown ..	—	0·81	2·16	18·29
Narridy	—	0·79	1·49	15·77
Redhill	—	0·71	4·15	16·54
Spalding	0·21	0·78	2·46	18·74
Gulnare	0·61	0·70	2·22	18·59
Yacka	—	0·64	1·65	15·38
Koolunga	0·1	0·65	1·60	15·32
Snowtown	—	0·72	3·80	15·70

Station.	Mar. 1936.	Av'ge. for Mas.	To end Mar. 1936.	Av'ge. Annual Rain-fall.
LOWER NORTH—*continued*.				
Brinkworth	0·2	0·75	1·28	15·73
Blyth	0·4	0·73	2·17	16·73
Clare	0·22	1·02	3·70	24·45
Mintaro	0 34	0·90	2·74	23·36
Watervale	0·7	1·11	3·34	26·74
Auburn	0·7	1·09	3·81	23·96
Hoyleton	—	0·78	2·52	17·27
Balaklava.......	—	0·72	1·41	15·43
Port Wakefield ..	0·17	0·91	2·94	12·93
Terowie	0·4	0·63	5·11	13·34
Whyte-Yarcowie	0·70	0·77	6·28	13·58
Hallett	1·01	0·66	3·58	16·41
Mount Bryan....	0·66	0·70	3·97	16·77
Kooringa	0·51	0·87	3·44	17·81
Farrell's Flat ...	0·14	0·74	4·43	18·54
WEST OF MURRAY RANGE.				
Manoora	0·10	0·82	2·39	18·94
Saddleworth	1·14	0·93	3·75	19·59
Marrabel........	0·75	0·84	2·84	19·96
Riverton........	0·14	0·99	2·93	20·79
Tarlee	0·19	0·80	2·66	18·09
Stockport	—	0·79	2·76	16·97
Hamley Bridge .	—	0·77	2·65	16·52
Kapunda	0·69	0·99	3·72	19·76
Freeling	—	0·87	2·04	17·79
Greenock	0·36	0·94	2·80	21·47
Truro	0·55	0·93	3·66	19·79
Stockwell	0·26	0·87	3·29	20·04
Nuriootpa	0·61	0·91	3·52	20·68
Angaston	0·27	0·98	3·96	22·32
Tanunda........	0·45	1·01	2·88	21·94
Lyndoch	0·1	0·84	1·52	23·27
Williamstown ...	0·5	0·96	1·38	27·61
ADELAIDE PLAINS.				
Owen	—	0·55	2·18	14·64
Mallala	0·4	0·76	2·08	16·49
Roseworthy	0·3	0·81	1·55	17·42
Gawler	0·1	0·90	2·21	18·85
Two Wells	0·26	0·77	1·96	15·76
Virginia	0·5	0·85	2·35	17·20
Smithfield	0·4	0·87	1·56	17·65
Salisbury	—	0·94	0·96	18·56
Adelaide	0·7	1·01	2·18	21·14
Glen Osmond....	0·3	1·02	2·33	25·97
Magill	0·4	1·14	1·81	25·37
MOUNT LOFTY RANGES.				
Teatree Gully ...	—	1·21	1·64	27·07
Stirling West ...	0·10	1·79	2·41	46·95
Uraidla	—	1·79	1·94	43·95
Clarendon.......	0·26	1·48	1·74	32·79
Happy Val'y Res.	0·13	—	1·76	—
Morphett Vale ..	0·21	1·12	1 31	22·59
Noarlunga	0·36	1·02	1·79	20·33
Willunga	0·18	1·21	1·54	25·97
Aldinga.........	0·16	1·04	1·21	20·21

RAINFALL—*continued.*

Station.	Mar. 1936.	Av'ge. for Mar.	To end Mar. 1936.	Av'ge. Annual Rainfall.
Mount Lofty Ranges—*continued.*				
Myponga	0·18	0·93	1·38	29·42
Inman Valley	0·19	—	1·96	—
Yankalilla	0·20	1·17	1·54	22·76
Mount Compass	0·10	—	2·18	—
Mount Pleasant	0·28	1·09	4·01	27·11
Birdwood	0·14	1·05	2·28	29·07
Gumeracha	0·6	1·27	1·53	33·31
Millbrook Res.	0·12	0·91	1·60	34·47
Lobethal	0·13	1·24	2·29	35·91
Woodside	0·13	1·17	2·33	32·15
Hahndorf	0·15	1·34	1·50	34·77
Nairne	0·52	1·26	3·24	28·12
Mount Barker	0·39	1·34	2·61	31·24
Echunga	0·14	1·43	2·82	33·25
Macclesfield	0·27	1·39	3·96	30·34
Meadows	0·15	1·64	3·18	36·02
Strathalbyn	0·44	1·03	3·37	19·32
Murray Flats and Valley				
Meningie	0·44	0·90	1·88	18·31
Milang	1·42	0·79	3·09	14·89
Langhorne's Ck	0·80	0·91	2·81	14·91
Wellington	1·04	0·87	3·14	14·65
Tailem Bend	0·22	1·00	4·00	15·06
Murray Bridge	0·25	0·89	3·06	13·51
Callington	0·36	0·83	2·41	15·15
Mannum	0·24	0·83	2·43	11·48
Palmer	0·25	0·85	3·40	15·59
Sedan	0·42	0·69	2·66	12·05
Swan Reach	0·31	0·75	3·21	10·65
Blanchetown	0·25	0·79	3·97	11·01
Eudunda	0·16	0·81	4·13	17·15
Point Pass	0·23	0·58	3·95	16·72
Sutherlands	1·12	0·64	4·34	10·81
Morgan	0·39	0·54	2·69	9·16
Waikerie	0·48	0·54	4·94	9·66
Overland Corner	0·22	0·80	4·18	10·25
Loxton	0·28	0·81	3·41	11·50
Berri	0·36	0·41	4·08	10·13
Renmark	0·29	0·67	4·85	10·38
West of Spencer's Gulf.				
Eucla	0·3	0·87	0·70	10·02
Nullarbor	—	0·73	0·66	8·85
Fowler's Bay	—	0·52	0·22	11·91
Penong	0·4	0·53	0·53	12·22
Koonibba	—	0·56	0·66	12·09
Denial Bay	—	0·53	0·79	11·19
Ceduna	—	0·49	0·79	10·21
Smoky Bay	—	0·36	0·39	10·42
Wirrulla	—	0·40	0·90	10·51
Streaky Bay	—	0·54	0·18	14·85
Chandada	—	0·38	0·34	12·42
Minnipa	0·5	0·52	0·71	13·91
Kyancutta	0·7	0·46	1·32	12·77
Talia	—	0·48	0·14	14·76
Port Elliston	—	0·53	0·16	16·51
Lock	—	0·48	2·08	16·34
Mount Hope	—	—	0·9	—
Yeelanna	0·5	0·58	0·28	15·94
Cummins	0·2	0·45	0·38	17·58
Port Lincoln	—	0·82	1·01	19·37
Tumby	—	0·74	0·74	14·25
Ungarra	—	0·75	2·30	16·87
Port Neil	0·2	0·63	1·74	13·11
West of Spencers Gulf—*continued.*				
Arno Bay	0·5	0·73	1·47	12·71
Rudall	0·9	0·50	2·25	12·98
Cleve	0·5	0·78	2·97	14·88
Cowell	0·2	0·81	2·39	11·07
Miltalie	0·7	0·98	2·58	13·70
Mangalo	—	0·73	5·82	13·86
Darke's Peak	—	0·49	2·52	15·08
Kimba	0·5	0·52	1·13	11·68
Yorke Peninsula.				
Wallaroo	0·6	0·81	2·60	13·97
Kadina	—	0·87	2·89	15·60
Moonta	0·2	0·85	1·91	15·06
Paskeville	—	0·74	6·18	15·47
Maitland	0·11	0·85	1·45	19·85
Ardrossan	0·4	0·74	1·78	13·95
Port Victoria	—	0·66	0·81	15·41
Curramulka	0·12	0·87	1·16	17·81
Minlaton	0·12	0·82	1·09	17·74
Port Vincent	0·13	0·63	1·30	14·38
Brentwood	—	0·73	0·61	15·54
Stansbury	0·18	0·77	1·51	16·81
Warooka	0·13	0·66	0·77	17·44
Yorketown	0·4	0·74	0·87	16·83
Edithburgh	0·12	0·81	0·99	16·37
South and South-East.				
Cape Borda	0·32	0·88	1·61	24·80
Kingscote	0·14	0·80	1·05	19·16
Penneshaw	0·22	0·72	0·81	19·00
Victor Harbour	0·15	1·00	2·20	21·40
Port Elliot	0·49	1·01	2·56	19·94
Goolwa	0·30	0·96	2·86	17·86
Maggea	0·30	0·46	4·83	10·20
Copeville	0·41	0·69	5·31	11·53
Claypans	0·50	0·51	4·01	10·42
Meribah	0·56	0·52	4·02	11·32
Alawoona	0·8	0·39	3·94	10·40
Caliph	0·25	0·59	3·38	10·98
Mindarie	0·66	0·50	3·78	12·23
Sandalwood	0·47	0·64	4·93	13·64
Karoonda	0·27	0·65	3·62	14·17
Pinnaroo	0·65	0·89	4·10	14·36
Parilla	0·11	0·65	3·30	13·72
Lameroo	0·8	0·80	3·09	15·87
Parrakie	0·16	0·78	3·00	14·56
Geranium	0·14	0·87	3·20	16·36
Peake	0·24	1·00	2·30	15·93
Cooke's Plains	0·24	0·94	4·39	15·28
Coomandook	0·30	0·94	3·04	17·03
Coonalpyn	0·19	0·88	2·19	17·61
Tintinara	0·13	0·89	1·84	18·62
Keith	0·17	0·77	1·93	17·93
Bordertown	0·66	0·82	2·27	19·14
Wolseley	0·45	0·76	1·97	18·47
Frances	0·37	0·91	1·90	20·08
Naracoorte	0·38	1·01	1·62	22·63
Penola	0·26	1·22	1·04	25·96
Lucindale	0·14	1·00	3·07	23·38
Kingston	0·27	0·99	1·93	24·24
Robe	0·13	1·02	1·54	24·64
Beachport	0·24	1·16	1·72	27·06
Millicent	0·39	1·31	2·61	29·83
Kalangadoo	0·46	1·15	1·61	32·20
Mount Gambier	0·39	1·42	1·53	30·37

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		May	June
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	1177	1	5
Alma	*	—	—
Angaston	*	—	—
Appila-Yarrowie	1177	1	5
Arthurton	1178	—	—
Ashbourne	*	6	3
Auburn Women's	1188	29	—
Balaklava	*	25	22
Balhannah	*	—	—
Balhannah Women's	1188	—	—
Balumbah	*	—	—
Balumbah Women's	*	6	3
Barmera	*	—	—
Barootа	1177	11	8
Beetaloo Valley	*	4	1
Beetaloo Valley Women's	*	—	—
Belalie Women's	1188	12	9
Belvidere	*	—	—
Berri	*	4	1
Blackheath	1178	7	11
Black Rock	*	—	—
Black Springs	*	5	2
Blackwood	*	11	8
Block E	*	—	—
Blyth	*	22	26
Booborowie	*	4	1
Booleroo Centre	1177	22	26
Boolgun	*	—	—
Boor's Plains	1178	7	4
Boor's Plains Women's	1188	7	4
Brentwood	*	4	1
Brimpton Lake	*	—	—
Brinkley	*	6	3
Brownlow	1177	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	21	18
Butler	*	—	—
Caica	*	—	—
Caliph	*	5	2
Carey's Gully	*	—	—
Chandada	*	—	—
Chapman's Bore	1178	4	8
Cherry Gardens	1178	2 & 30	—
Chilpuddie Rock	1178	—	—
Clare Women's	1188	2	6
Clarendon	*	24	23
Collie	*	6	3
Coomandook	*	29	26
Coonalpyn	*	6	3
Coonalpyn Women's	*	6	3
Coonawarra	*	7	4
Coonawarra Women's	1188	21	18
Cummins	*	8	12
Cungena	*	7	4
Currency Creek	1178	4	8
Devlin's Pound	1178	—	—
Devlin's Pound Women's	1188	6	3
Dudley	*	—	—
Echunga	*	13	—
Echunga Women's	1188	6	3
Eurelia	*	9	13
Eurelia Women's	*	6	3
Finniss	*	—	—
Frayville	*	—	—
Gawler River	*	—	—
Georgetown Women's	*	12	9

Branch.	Report on Page.	Dates of Meetings.	
		May	June
Gladstone	*	1	5
Gladstone Women's	1188	19	17
Goode	1178	—	—
Goode Women's	*	—	—
Green Patch	1178	7	4
Greenock	*	18	19
Gumeracha	*	4	8
Hanson	1177	5	2
Hartley	1178	6	3
Hilltown	1177	5	2
Hindmarsh Island	*	—	—
Hope Forest	1178	4	1
Hope Forest Women's	1188	—	—
Inman Valley	1178	21	18
Iron Bank	1178	6	3
Jamestown	*	20	17
Jervois	*	14	11
Kalangadoo	*	9	13
Kalangadoo Women's	*	9	13
Kangarilla Women's	1188	21	18
Kanni	*	—	—
Karte	*	—	—
Karte Women's	1188	6	3
Kelly	1178	2	6
Ki Ki	*	—	—
Kilkerran	1178	4	4
Koolunga	*	—	—
Koonunga	1177	—	—
Koppio	*	6	3
Kulkawirra	*	12	9
Kyancutta	*	5	2
Kybybolite	*	7	4
Kybybolite Women's	*	5	2 & 30
Lameroo	*	2	6
Laura	*	27	24
Laura Bay	*	12	9
Laura Bay Women's	1188	16	13
Lenswood and Forest Range	*	—	—
Light's Pass	1177	4	1
Lipson	1178	2	6
Lobethal	*	21	18
Lobethal Women's	*	18	15
Lone Gum and Monash	*	21	18
Lone Pine	*	4	1
Longwood	*	—	—
Lyndoch	*	5	2
MacGillivray	*	5	2
McLaren Flat	1178	—	—
McLaren Flat Women's	*	7	4
Maltee	1178	7	4
Maltee Women's	1188	—	—
Mangalo	*	—	—
Mangalo Women's	*	13	10
Marama	*	—	—
Milang	*	2	6
Millicent	1177	22	26
Millicent Women's	*	—	—
Miltalie	*	2	6
Minnipa	*	—	—
Monarto South	1178	—	—
Monarto South Women's	1188	16	20
Moorlands	*	6	3
Moorook	*	—	—
Morchard	*	1	5
Morchard Women's	1188	27	24
Mount Barker	*	18	15
Mount Bryan	*	—	—
Mount Compass	*	7	4
Mount Gambier	1177	8	12
Mount Hope	1178	5	2

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.	
		May	June
Mount Pleasant	*	6	3
Mudamuckla	*	9	13
Mudamuckla Women's	1188	20	17
Mundalla	1177	—	—
Mundalla Women's	*	7	4
Murray Bridge	*	—	—
Murraytown	1177	—	—
Mypolonga	*	—	—
Myponga	1178	21	18
Myponga Women's	*	14	11
Nantawarra	*	7	4
Narridy	1177	—	—
Narridy Women's	1188	—	—
Narrung	1178	—	—
Nelshaby	1177	—	—
Nelshaby Women's	1188	—	—
Nunjikompita	*	7	4
Nunkeri	*	7	4
O'Loughlin	1178	11	8
O'Loughlin Women's	*	—	—
Owen	*	11	8
Palabie	*	—	—
Parilla	*	19	16
Parilla Women's	*	20	17
Parilla Well	*	4	8
Parilla Well Women's	1188	26	30
Parrakie	*	—	—
Parrakie Women's	*	26	24
Paskeville	*	5	2
Penola	1177	2	6
Penola Women's	1188	—	—
Penwortham	1177	7	3
Petina	*	28	27
Pinbong	*	2 & 30	27
Pinbong Women's	1188	—	—
Pinkawillinnie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	1188	1	5
Port Elliot	*	—	—
Pygery	1178	5	2
Pygery Women's	1188	12	9
Ramco	*	4	1
Redhill	1177	5	2
Rendelsham	1177	5	4
Rendelsham Women's	1188	—	—
Renmark	*	—	—
Riverton	*	11	8
Roberts and Verran	*	—	—
Rosedale	1177	—	—
Roseworthy	*	—	—
Saddleworth	*	8	5
Saddleworth Women's	1188	5	2
Scott's Bottom	*	2	6
Sheoak Log Women's	1188	—	—
Shoal Bay	*	5	2
Snowtown	1177	8	12
Snowtown Women's	1188	7	4
South Kilkerran	1178	4	1
Springton	*	6	3
Stanley Flat	*	18	15
Stockport	1177	—	—
Strathalbyn	*	12 & 21	9
Strathalbyn Women's	*	14	11
Sutherlands	1178	7	4
Tantanoola	1177	2	6
Tantanoola Women's	*	6	3
Taplan	*	5	2
Taplan Women's	*	—	—
Taragoro	*	7	4
Tarlee	*	—	—
Tatiara	*	—	—
Truro	1178	18	15
Ungarra	*	—	—
Upper Wakefield	1177	7	4
Wallala	*	18	13
Wandearah	1177	5	2
Warcowie	*	5	2
Warcowie Women's	*	—	—
Warramboo	1178	5	2
Warramboo Women's	1188	—	—
Wasleys	*	7	4
Wasleys Women's	1188	7	4
Watervale	*	18	15
Weavers	*	11	8
Wepowie	*	4	1
Wepowie Women's	*	—	—
Whitwarta	1178	18	15
Wilkawatt Women's	*	19	16
Williamstown	*	—	—
Williamstown Women's	*	6	3
Willowie	*	25	22
Wilmington	1177	19	16
Wilmington Women's	1188	14	11
Wirrabara	*	—	—
Wirrabara Women's	1188	21	18
Wirrilla	1178	7	6
Wirrilla Women's	1188	7	4
Wolseley	*	9	13
Wudinna	*	—	—
Yadnarie	*	5	2
Yandiah	*	8	12
Yandiah Women's	1188	8	12
Yeelanna	*	6	3
Younghusband	*	—	—
Yundi	*	—	—
Yurgo	*	—	—
Yurgo Women's	*	—	—

* No report received during the month of March. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from 1st August, 1934, with the following exceptions:—Life members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

SOLDERING.

The following paper was read by Mr. E. A. Wilksch at a meeting of the Greenock Branch on 16th December:—

Soldering cannot be fully mastered at once, but a certain degree of efficiency may be attained with a little practice, providing, of course, that one has reasonably good appliances with which to work. First, a good iron is necessary; it should be neither too blunt-nosed nor too heavy. A heavy iron would be found very clumsy. On the other hand, the iron should not be too light as it will not retain its heat for any length of time. It is a great asset and time-saver to have two irons of different weight or size, for access is more easily gained to some places with a reasonably small iron than with a bigger one. Another advantage of two irons is that one may be heating while the other is being used.

Perhaps just as important as the iron is an efficient flux. There are several fluxes such as resin, spirits of salts, and other acid solutions. The most efficient one is Baker's Soldering Fluid. Spirits of salts is also not to be belittled, but it has to be first broken down. Baker's fluid, in common with several other commercial solutions, is put on the market in tin containers, and when purchased, it should be transferred from its original container to a bottle of convenient size, preferably one with a screw or clip top, for convenience as well as security. If this is not done the solution will become discoloured through rust having developed. A feather is quite useful in applying the solution. The remaining necessities are a good 50-50 solder, a rag to wipe the iron free of ashes, sandpaper or emery cloth to clean the place to be soldered, and a fair seasoning of patience. Acid and resin-cored coils of solder are also more used than previously. As regards the heating element, a fire of good coals is all that is required—mallee or she-oak are to be preferred. A blow-lamp is also quite suitable.

To tin an iron, clean it well (this is important) then get it very hot. Tilt a lid or similar receptacle and pour into it a small quantity of fluid. With the hot iron (wiped to remove ashes) drip some solder into it and follow by dipping the iron into it, and with its aid melt the solder. By careful manipulation, endeavour to coat the end of the iron as far as necessary with the molten metal. A different method is to rub the cleaned hot iron in a small amount of solder on a block of sal-ammonia. After tinning an iron by this method several times a slight indentation is made in the block, which greatly facilitates the operation. It is not necessary to touch on the simpler forms of soldering beyond stressing the importance of not applying more flux than is necessary, because molten solder has a property of spreading to places where it is not wanted.

A person sometimes has the unpleasant experience of not being able to persuade the solder to adhere to an apparently clean surface. This may be overcome by giving it a rather more generous application of flux.

To solder a fairly large hole, drill it out well into the sound metal, drilling from both sides if possible, in order to clean it. Cut a small piece of brass or other metal and file it to fit roughly. Give all a good application of flux, and keep it in place with a handful of paper. With a well-wiped hot iron convey a drop of solder to the place to be soldered and keep the iron on it for a moment, and a neat, strong mend will be effected. One advantage of this re-inforced mend is that it is practically flush with the surrounding surface. Should the hole be smaller, and therefore not lend itself to this type of repair, but yet be difficult to cover with solder, hold directly under the hole a handful of paper. Besides keeping the solder in place it keeps the hands from becoming uncomfortably hot. After an article has been soldered the place should be wiped or, if possible, washed in warm, slightly soapy water in order to remove surplus flux, otherwise it will undoubtedly set up corrosion in the form of rust, or, in the case of brass and copper, verdigris. (Secretary, A. Schubert.)

THE PROBLEM OF THE YOUNGER GENERATION.

The above was the subject of a paper read by Mr. C. Menadue at a meeting of the Chapman's Bore Branch on 11th November. In the course of the paper he pointed out that the position of the younger generation would be very much different from that of their fathers, because of changed economic conditions. Farming would call for only the best equipped and most efficient men, who must have a good knowledge of everything that concerned a farmer's business. Many of the boys of the district were not equipped to face such a position, because they had not had the opportunity of acquiring a good education. The poor-soil lands of the district offered many problems. In consequence youths should be trained to enable them to get the most from their labours under such conditions. In all trades, arts, and crafts it was necessary for a boy to have a technical school training, yet very often a farmer's son was allowed to go through life untrained and unfitted to cope with the difficult problems of farming. Parents should try to impress upon their sons the importance of the Agricultural Bureau as a means of gaining knowledge of the best farming methods for the district. (Secretary, J. P. Krollig.)

FAR NORTHERN CROP COMPETITION.

The presentation of the prizes won in the 1935-6 Far Northern Crop Competition took place at the residence of Mr. W. G. Gregurke, of Wepowie, on 19th March. Mr. H. G. Kupke (Morchard), Chairman of the Competition Committee, presided over an excellent attendance. Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau) presented the following trophies:—First prize, W. G. Gregurke, casserole dish; second prize, T. F. Orrock, E.P. fruit stand; third prize, E. H. Hampel, of Wilmington, E.P. dish.

It is worthy of note that in each of the Competitions that have been held in the Far North District, Mr. Hampel has on each occasion been successful in receiving a prize, a record which it is doubtful if any other competitor in the State has achieved.

To encourage the growing of wheats of high milling quality, the Millers' Association of South Australia this year donated five guineas to each District Competition, on the condition that the prize money should be distributed amongst the successful competitors, provided their crops were not one of the following varieties:—Gallipoli, Free Gallipoli, Ghurka, Waratah, or Nabawa. Mr. G. Addison, on behalf of the Association, made the following presentations:—First prize, W. G. Gregurke, gold watch; second prize, T. F. Orrock, 8-day clock. Items were contributed by Miss Whittle, Mr. F. C. Richards, Miss Roocke, Miss Davill, Mr. Noblett, Miss Rogers, and Miss Schultz. The members of the Wepowie Women's Branch provided supper, and the evening concluded with dancing.

HARVEST REPORTS.

GOODE.—Ten members attended a meeting on 4th March, when harvest reports were given, the majority of members reporting best results from Nabawa. Mr. C. P. Linke reported that for a number of years Florence and Quality had given him the best returns. Mr. J. Kelly stated that a fine-looking crop of Ford had been very disappointing, Nabawa and Wagga yielding much better. Ranee was said by some members to be suitable for the district, and all members were advised to try it. Mr. B. A. Linke stated that Gluford and Nabawa had, for some years, given best results on his property.

PYGERY.—At a meeting held on 10th March Mr. R. Woodrup reported that crops were good until October, when take-all and hay-die commenced to develop. His best return, six bags per acre, was from Waratah sown with a drill, while the same seed sown with a combine on the same day and on well-worked land yielded only three bags. Waratah and Merriden sown late on grassland returned two and a half bags. On fallow Merriden was badly affected with take-all and yielded four bags. Mr. E. H. Edmonds's best wheat on stubble was Ford, followed by Ranee and Nabawa. Mr. G. P. Symonds reported that all wheat was sown on land which had carried oats last year and at the rate of 50lbs. seed and 60lbs. super. Take-all was bad except in the headlands (drilled twice), where there was none. Mr. W. M. Heath reported fallow crops more affected with take-all than grassland crops. Sword yielded best, with a return of five bags. Nabawa and Ranee were better than Waratah. Mr. A. Day reported that Ranee on grassland, which had been ploughed and sown with a combine at the rate of 50lbs. seed and 70lbs. super, yielded six bags, Nabawa on new land five bags, and Waratah on stubble four bags.

MALTEE.—At a meeting on 5th March 11 members attended and gave reports of their harvest results. Mr. C. T. Schwarz had the best crop with a yield of 18bush. from Late Gluyas; Early Gluyas returned 15bush. The average was 11bush. and was the best in the district. Mr. L. M. Martin reported a return of 11bush. from Felix. Dry seeding conditions and take-all and rust lowered the returns considerably. The average for the district was 6bush.

CHAPMAN BORE.—Fifteen members attended a meeting held on 10th February, when harvest returns were discussed. Mr. C. H. Randell reported oats sown on grassland with 1bush. seed and 75lbs. super averaged four bags. Wheat sown with 54lbs. seed and 90lbs. super returned 7bush. Mr. R. Ackland stated that oats sown on stubble with 40lbs. seed and 45lbs. super returned a useful cut of hay and a satisfactory yield of grain. Sultan had been the best wheat variety. Mr. A. Hill sowed oats on fallow at the rate of 40lbs. seed and 75lbs. super. The crop was badly infested with weeds, especially Cape weed, and the yield was low. Wheat sown on grassland at the rate of 50lbs. seed and 75lbs. super returned 7bush. Mr. C. Menadue reported Early Burt oats sown on drifty sand with 50lbs. super and 60lbs. seed cut approximately half a ton of hay per acre. Algerian oats sown on fallow with 50lbs. seed and 50lbs. super cut one ton per acre. Wheat on fallow was sown on sandy soil with 55lbs. seed and 80lbs. super. Dan averaged three bags, Ranee 10bush., Waratah 11bush., Baldmin three bags, and Nabawa three bags. Mr. H. Burbridge reported that oats sown with 60lbs. seed and 45lbs. super averaged four bags on fallow and one bag on stubble. Wheat sown with 45lbs. seed and 45lbs. super on new land yielded two bags from Nugget and Dan one bag. On second-year land, sown in May, Nabawa returned two and a half bags and Federation one bag. Mr. W. Whitehead had received a yield of two bags from oats sown with 40lbs. seed and 45lbs. super. Wheat sown with 45lbs. seed and 70lbs. super returned four bags on fallow land and two and a half bags on stubble. Oat crops throughout the district were badly damaged by wind, some being reduced to a total loss.

ARTHURTON.—At a meeting held on 18th February, with an attendance of 14 members, Mr. Brine reported that crops had been rather light. Smutproof wheat had shed badly during rough weather. Barley returned approximately six bags per acre. Mr. Rudd reported a yield of six bags from barley and six bags from Ranee wheat. Wild turnip and stormy weather conditions had greatly reduced wheat yields. Some crops had also been affected by a frost which had occurred on 25th October. Mr. R. Honner also reported damage by frost. Mr. S. K. Coleman stated that stormy weather had done much damage, some patches in the Ford and Sword returning little or no grain. He had grown Plumage Archer barley, but owing to the tendency for the heads to fall off he did not recommend the variety. Mr. L. Clasohm stated that Ghurka and Ranee varieties had not been so much affected by the bad weather conditions because they ripened earlier than Ford and Sword, in which there had been considerable loss. Fallow crops had returned 11 bags per acre and stubble land eight bags. Barley yielded about 27bush. Mr. L. Short had best results from Sword—about 11 bags per acre. Other varieties yielded seven to eight bags and barley seven bags. Mr. E. Palin's wheat average was 28bush. to 29bush. and barley averaged six bags. Mr. S. Henderson reported that Ford returned eight bags, Sword over eight bags, and Aussie and Ranee 30bush. per acre. Plumage Archer barley on grassland had yielded 10 bags per acre.

HILLTOWN.—A meeting on 3rd March, attended by 26 members, was the best since the Branch was opened. Mr. R. L. Sluggett was congratulated on his success in winning the Midland Wheat Crop Competition. *Crop Reports.*—Good spring rains, following a fairly dry winter, resulted in crops yielding higher than was expected. The absence of disease was noticeable, no rust being reported and only a little flag and loose smut. Some heavy yields were recorded, noticeably from Gallipoli and Ghurka. The meeting discussed the advisability of continuing with such varieties. Some members held that, in view of their low milling qualities, they should be discarded for national reasons.

BOOLEROO CENTRE.—At a meeting held on 6th March, members gave the following harvest reports:—

F. H. Reichstein.—The season 1935-36 was a disastrous one, particularly to those farming outside Goyder's line of rainfall. The useful rainfall period (from May to November) amounted to only about 5in. Had it not been for the splendid rains in October, 1934, penetrating the subsoil and conservation of that moisture the season would probably have been a failure in this district; as it was the average was below

5bush. The first seeding rains did not arrive until July. August was not a wet month, but October was better than usual, saving the situation. The best wheats were Bobbin, which returned 9bush., dry sown, and Dundee, 8bush., wet sown. Ghurka was third, averaging 6bush., while Ranee went from 3bush. to 4bush per acre. Dundee is going to be a good wheat for our district; it is as early or perhaps a little earlier than Ranee. Bobbin is a good wheat too, for as far as bleaching from rain is concerned it is far ahead of Ranee, as Bobbin sheds the rain, while with Ranee it runs straight into the head. But as usual with all our good standing and yielding wheat the stubble is practically useless as a dry fodder for stock. My wheat was too short to cut hay this year. In this district it is good practice to use a stripper on some of the crop to save the cocky chaff, besides a stripper does not ruin the stubble as a header does. It is a mistake to reap all the crop with one machine. There was a wonderful sample of wheat here this year, perhaps the best ever.

T. H. Borgas.—Crop up to the average over the past 14 years. Average, 19bush.; best wheat, Ghurka, 21bush. Early sown wheat was the best. To cultivate fallow before seeding is very beneficial. I have saved cocky chaff for the past 19 seasons and have been able to get rid of it each year. It must be taken care of.

R. W. Reichstein.—The Dundee variety was a failure this year as far as milling for flour was concerned. Sword variety was good. The soil conditions play a big part so far as the quality of a wheat goes.

Chas. Patterson.—Three varieties of wheat sown—Sword, Ranee, and Nabawa. Sword germinated and came up poorly; soil of limestone nature; it had a good head and was of a wonderful sample. Ranee, best average yield. Nabawa, splendid sample; where the land had been cultivated three times and where the moisture had been conserved there was a tendency to malt badly, but on stubble fallow the grain germinated much better; average was 10bush. The cocky chaff should be saved, and for this purpose a stripper harvester is best. A header destroys the stubble and header cocky chaff is not as good.

W. Sewsmey.—Ranee was the best wheat and was a perfect sample. Carawa was the best of the late wheats. Sword is not suited to this district. It was inclined to turn and was not nearly as good a sample as some other wheats sown.

W. A. Mills.—The sample was unquestionably the finest I have ever harvested, both as far as weight and looks are concerned when one considered the poorness of the stubble and the very light rainfall that we had. Ranee averaged 10bush. Nabawa averaged 18bush. on a field that was exceptionally well worked and was planted under favourable conditions. I had some experimental crops on stubble land sown with oats and various dressings of ammonia and super mixed, but they were practically a failure, making no growth until late in the year. In this district the saving of cocky chaff is essential, and the best way of doing this, in my opinion, taking into consideration the stubble afterwards, is by the stripper and winnower.

The following paper, "The Advantages of a Weed Cutter," was read by Mr. F. H. Reischstein:—"There are two types of weed cutters—the V-shaped and the straight, but the straight type is the best suited to any undulating ground, such as claypans and watercourses; of course, it will not work in stony or boulder country. This implement is made up of old tine scarifiers, and can be made very cheaply. Most farmers who have a blacksmith's shop can make one by hiring a smith for a few days. My cutter has a cut of 15ft. 3in. and the blades are cut from a 16ft. length of 4in. x ¼in. plough plate steel and sharpened one side. This steel cost 22s. 6d. per hundredweight; one cut makes two blades. The cost of my weed cutter was approximately as follows:—

	£	s.	d.
Two large wheels at 10s. each	1	0	0
Two small wheels at 16s. each	1	12	0
Two old scarifiers (minus wheels)	0	10	0
One bag coal	0	5	0
One set blades, 4in. x ¼in.	0	11	6
Smith's wages (eight days at 6s. 6d. a day) ..	2	12	6
Two bars ⅝in. iron	0	7	0
One 16ft. main axle	0	10	0
Miscellaneous	0	10	0

It can be seen, therefore, that this is not a very expensive implement. Since the rains, up to 35 acres a day have been done with 12 horses, but nine or 10 horses will work it comfortably. The big advantage in working over fallow in the summer time is that all the weeds are killed without disturbing the seed bed; also a large acreage can be gone over in a few days compared with using a combine. This year I have worked 400 acres out of 500 acres of my fallow and I am convinced that it is going to give better results than cultivated fallow. In the lower rainfall district harrows are not used nearly enough. There is less evaporation in fallow that is left harrowed down."

EXPERIMENTS WITH NITROGENOUS FERTILISERS.

At a meeting of the Mundalla Branch, held on 19th February and attended by 16 members, Mr. E. L. Milne reported on experiments he had conducted with nitrogenous fertilisers. The experiments were carried out with 1 and 1 super and ammonia fertilisers on stubble and grassland ploughed and sown to oats. Results were disappointing as regards yield of grain; the improvement in grain yield over the ordinary super crop not being sufficient to warrant the extra expense and work. The 1 and 1 mixture was rather difficult to get through the drill. The crops receiving the 1 and 1 mixture had a better appearance than the crops sown with super only. Mr. Milne considered that if the crops had been cut for hay the nitrogenous fertiliser might have shown better results.

THE COMBINE.

A paper, "The Combine," was the subject of a meeting of the Murraytown Branch held on 29th February, and attended by seven members. The writer, Mr. E. B. Pitman, stated that it was approximately 20 years since the combine came into general use. To-day only a few farmers still used a cultivator and seed drill for sowing crops. The combine was satisfactory so long as there were only small weeds to kill at seeding time, but where there were large, strong weeds in wet soil no combine would tear them sufficiently to kill them in the one operation. The driver of a combine should be careful to see that he neither overlapped nor cut too wide. He should also keep a watchful eye on the sowing of both seed and super. All oil holes should be kept clean. With spring tyne combines one should make sure that no tyne had moved along the float and thus was not cutting its proper share of the soil. The I.H.C. combine was a fairly light-draft type with good spring tynes which would withstand a lot of work before breaking. It had chain-driven gears, and the quantity of super being sown could be adjusted while the machine was in use. Bad points were that the hopper was too close to the wheels. In hilly, stony country stones were picked up and fell between the hopper and the wheels, causing broken spokes. Wheels were of rather light construction. The team pulling gear was too narrow and allowed too much lash. The Massey-Harris machine the writer had used was of the rigid-tyne type, 16 hoe. It had good strong wheels and a good team pull. Owing to the many bars running across the floats, any rubbish picked up stayed in the machine and it was difficult to clean it out. On stony land the writer had had numerous breakages in the super drive. For the above reasons he considered it chiefly suitable for clean land. The tynes and floats were of strong construction. The H.B. had a good clearance between the hopper and the strong, sturdy wheels. The team gear was arranged in give a minimum of lash with the fore carriage. It possessed a disc-gear drive which seemed fairly reliable. If one was prepared to use plenty of strength to pull it, the pressure springs could be closed up enough to make it almost a set machine, which would then tear up the hardest of set soils where a spring tyne would ride over the surface. The crossbars of the floats were inclined to give way to the side-thrust of the tynes when the machine was turning. No difference in crop returns had been noticed between the use of machines with back and middle sowing tynes. *Discussion.*—Mr. Reichstein considered that the I.H.C. chain drive resulted in lighter draft than with other combines using gear drives. In several years operations of centre sowing and back-row sowing combines they had not been able to notice any difference in the yield. Broken spokes were best replaced by plain spokes with nuts inside the hub and outside the tyre, screwed down tightly.

BULK HANDLING OF GRAIN.

At the March meeting of the Wirrilla Branch Mr. S. Dennison, M.P., gave an interesting address from information obtained during his recent visit to Western Australia, when he accompanied a Parliamentary party to investigate bulk handling of wheat, gathering much information from the Co-operative Bulk Handling Co. and other users.

Mr. Dennison explained that at Fremantle there were two loading gantries converted for dealing with wheat in bulk at a cost of £160,000, and it was anticipated that £439,000 would be required to complete terminals to handle the total crop of about 23 million bushels.

The gantries seen were worked by worms through long troughs which could move 180 tons an hour each. Overhead elevators, buckets, and chutes were worked filling ships, the wheat being poured anywhere into the ship. An allowance of 2½ per cent. of deck capacity below was stored on deck to fill up when settlement of cargo took place.

A duplicate Clarke shovel was used for emptying railway trucks, and that way two men loaded two 14-ton trucks in 22 minutes.

The Western Australian railway trucks were fitted out for bulk grain by adding hessian liners and canvas extensions stiffened with cane to increase carrying capacity, sheeted with tarpaulins, and fitted with aproned coverings to the conveyors to prevent spilling, all fittings being the property of Bulk Handling Co. A subsidiary boosting elevator was worked from a reserve to cover any lull in filling. At terminals a toll of ⅜d. per bushel was made, which provided for repayment of capital, interest, depreciation, and insurance, and a ⅛d. to Westralian Farmers for services rendered. It was pointed out that at 4½d. bushel it would be possible to pay off in 10 years all the cost of installation to handle all the Western Australian crop, and the equipment would then become the property of the growers.

The delivery warrant issued for receiving wheat was negotiable, but the wheat remained the property of the farmer till he sold. Storage charges of one-tenth of a penny a month were made from 15th March till 31st October; after that date the company had the right to sell.

Mr. Dennison quoted balance-sheets obtained from two farmers. A Mr. Uppill on 16,066bush. showed a profit of £157 0s. 9d., or 2.48d. per bushel. Mr. Ackland showed a profit of £111 5s. on 11,400bush.—2.219d. per bushel, and a saving of three weeks' harvesting.

Mr. Dennison outlined a scheme which has been drawn up to get bulk handling in South Australia from methods successfully used in Western Australia and New South Wales, and urged all present to work to get bulk handling as the most successful way of handling wheat and saving expenses.

REVIEWING THE PRESENT SYSTEM OF FARMING.

Mr. C. Rechner read the following paper before an attendance of six members at a meeting of the Kilkerran Branch held on 9th March:—As the rainfall over the greater part of this district is probably in the neighbourhood of 15in., we cannot indulge in the intensive pasture improvement which may be possible in districts with a rainfall of 20in. to 25in. However, as the ideal rotation for cropping should include one year letting the land lie out as pasture, a heavy dressing of superphosphate will do much to encourage our natural grasses and help to improve the soil for the following crop.

In the past we have not paid enough attention to encouraging clovers and other natural fodder plants to establish themselves. Our present system of farming, on the contrary, has had the effect of killing them out.

A good practice carried out successfully in the middle north is to sow about 2lbs. of lucerne per acre with the wheat crop at seeding time. This will establish itself sufficiently to withstand being fed off when the stock are turned into the stubble, and will grow up after a summer rain. If the stubble is burned, the lucerne withstands the burn well. In fact, it appears to stimulate its growth, even surviving the shallower cultivation in preparation for the barley crop.

The relative high price of land and low prices hitherto received for wool has necessitated farmers in this area being mainly restricted to the growing of wheat and barley in conjunction with the raising of fat lambs.

However, I consider that in view of the low prices ruling for barley at the present time some alteration in our rotational system of fallow-wheat-barley could be safely undertaken. In view of the enhanced prices for export lambs and the improvement in the price of wool, a crop of oats could be substituted for barley. The oats could be dealt with as pasture to fatten lambs and run sheep on. If such land were fallowed the following year, a big improvement should result in the ensuing wheat crop.

If the area proved too large to feed down, a portion of it could be harvested and fed to the sheep during the autumn, when feed usually is scarce.

By this time the lambs will have been marketed, and a larger flock of ewes could be carried without danger of over stocking if oats were fed in addition to their pasture.

The land would not be subject to over cropping and would be in good heart, so that, when more remunerative prices are offering for barley, we could revert to the old system of fallow-wheat-barley without a great deal of inconvenience in the change over.

CARE OF SHEEP.

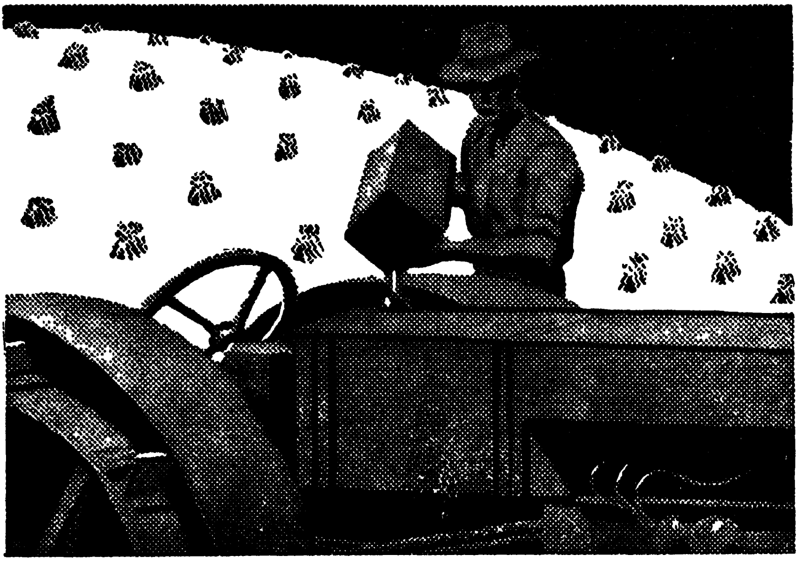
In the course of a paper read at a meeting of the South Kilkerran Branch on 2nd March, Mr. B. W. Schulz recommended inspecting the flock a week or two before shearing and cleaning them up around the crutch with a pair of blades in order to give the machine shears a better chance to get close to the skin. During shearing time more care should be taken not to handle the sheep in any way roughly. Sheep owners should attend the shearing more often and not allow shearers to handle the sheep roughly. They should also see that the wool was taken off closely, without too many second cuts being made, and that the sheep were not turned out with too many ridges left on them. Farmers could do more classing of their wool. It would pay to keep the hogget wool separate from wool from older sheep, as a hogget was likely to produce a fleece of longer staple than an old sheep.

Dipping.—Dipping could be done immediately after the sheep were shorn. It would be more effective if done while the sheep were clean and the dip mixture would act as a disinfectant for the cuts and wounds the sheep had received during shearing. After dipping they should be turned into a fallow paddock. Dust would collect on the tips of the wool that was left, and would act as a little protection for the skin against the sun and the cold weather. Sheep which were dipped a month of two after shearing did not receive the full benefit of the dipping mixture. The writer had shorn lambs carrying ½in. wool which had been dipped about a fortnight before being shorn. The dipping mixture had reached the skin all over the body, but from the top of the head half way down the back of the neck a strip of skin was left which had not been touched by the dip. Care should be taken when dipping to see that that part of the sheep was soaked thoroughly. It could not be done thoroughly unless each sheep was pushed under and kept under for a few seconds. If that were done about three times it should result in the sheep being dipped correctly. Sheep should never be put through the dip immediately after travelling a long distance. They should stand in a yard for an hour or two; otherwise the result might be two or more dead sheep, because they were likely to swallow some of the liquid if they went through the dip while panting. An S hook was very useful, both for pushing the sheep under and for hooking a sheep under the neck in case of drowning. If sheep were dipped immediately after shearing, eight or nine thousand could be put through before the dip required renewing, while if sheep were left a month or longer after shearing, not more than four or five thousand could be dipped before the dipping mixture was changed. A number of farmers had not dipped their sheep of recent years. Such neglect was unfair to their neighbours who dipped every year to free their sheep from lice and tick.

Crutching and Eye-clipping.—Crutching should be done at least three times per year if done with blades; if machines were used twice a year would be sufficient. It was the best and only remedy to overcome the blowfly pest. If crutching were done before any sheep were fly-blown, the blowfly would not be encouraged. Farmers who let their sheep go as long as possible to save the expense of crutching made a big mistake. Crutching at the rate of £1 per 100 would be cheap (although only about 10s. per 100 was usually charged for machine crutching), as one only had to lose two sheep or lambs out of a hundred by blowfly strike to equal the cost of crutching. As soon as an owner found one sheep struck by flies he should lose no time in getting them crutched. Even the one sheep already struck might mean a greater loss to the owner than he anticipated. Ofter a sheep which had been badly struck by maggots grew a fleece with a break in the wool. One such fleece found among other good wool might cause the whole bale to be condemned as far as value was concerned. All sheep inclined to be wool-blind should be clipped aroung the eyes just before the barley grass dried off. Otherwise barley grass seeds would be picked up and work their way into the sheeps' eyes.

Lambing.—All rams should be taken out of the flock a month of two before the first lamb appeared. It did not pay to keep the rams in the flock all the year round. One well-grown lamb was worth more than two "poddies," and the mother would be given a better chance to grow a more valuable fleece. Where rams were left in the flock all the year round, it often happened that the first lamb still sucked its mother when the second one arrived, with the result that the second lamb had a very poor chance of survival. The same applied to the old sheep. Just before lambing it was necessary, especially with young sheep, to shear them around the eyes, so that they could see around them better when they dropped their lambs. It was noticeable that when a wool-blind sheep dropped its lamb crows soon appeared on the scene. One crow would draw the attention of the sheep and the others would attack the lamb. Many lambs were lost in that way, crows doing more harm than foxes at lambing time.

Starving Sheep.—A good many sheep owners tried to run more sheep than they could provide feed for. Great losses occurred by starving a flock of sheep. It was far better to have a little left in the paddocks than to see sheep hunting for feed. A sheep could lose in one week as much condition as it would take a month or even longer to regain. Not only did a sheep lose condition, but it also checked the growth of the wool. Any sheepowner who had kept sheep at a loss should aim at keeping less sheep, keep them in good condition, produce good wool, and rear a profitable lamb.



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RUGGING SHEEP.

At a meeting of the Green Patch Branch on 5th March, Mr. D. Cash gave a report on his experiments in rugging sheep. He was using 20 ewes and 20 wethers (all 4 tooth), as well as a similar number unrugged. He stated that in rough limestone or mallee country rugs would be useless as it would not be possible to keep the rugs on the sheep. Even in an open paddock he found that constant oversight of the sheep was necessary in order to keep the rugs in place. Where conditions were such that they could not be examined daily he considered that rugging would not be practicable. The fitting of the rugs took a great deal of time. They had to be well fitted or the sheep would soon get rid of them, even in an open paddock. The rugs he used were bought rugs, and he considered that they should be made more adjustable. He could see that several more fittings would be necessary as the wool grew. Some sheep took to the rugs quietly, while others did their utmost to get rid of them.

CARE AND MANAGEMENT OF CHAFFCUTTERS.

The following paper was read by Mr. Thos. Rodda at a meeting of the Boor's Plains Branch held on 5th March:—"Chaffcutters, like all machinery, require to be set on a solid foundation in the earth to ensure absolute rigidity and steady working. A machine set on an unsound foundation will not run freely and will soon commence to work and vibrate in the joints of the framework and undue wear will take place in all the bearings and spindles, causing heavy driving. Set on a good foundation and with reasonable care and management, a chaffcutter will work smoothly and evenly, with the minimum amount of driving power and give good and lasting service.

Setting.—If the machine is to be set in the open near the stack, the place should first be levelled off. Four holes should be sunk corresponding with the legs of the machine. A stump leg of hardwood (preferably jarrah) should be bolted on the lower end of each leg of the chaffcutter. The stumps should be 4in. x 4in. cut 20in. long. About 4½in. at one end should be halved so that the end of the cutter leg will stand on the shoulder. It should then be bolted to the leg with a ½in. bolt. The machine should then be set in the exact position. Care should be taken to level correctly the knife wheel spindle in one direction and the bevel gear spindle in the other. For small machines it is sufficient to ram the earth well around the stumps. For large machines concrete should be used. Care must be taken to see that the pulley is in correct alignment with driving pulley. The best belt length is approximately 12ft. from centre to centre of pulley spindles. The width of belt, working speed, driving power required and cutting capacity per hour are as follows:—A No. 3, running at 350 to 400 revolutions per minute, needs approximately 4 B.H.P. with a 3½in. belt, cutting approximately 15cwt. per hour. No. 4, the most general cutter, running at 400 to 500 revolutions per minute, needs 7 B.H.P. with a 4in. to 4½in. belt, cutting in the vicinity of 2 tons per hour. If it is desired to use screens or an extra long elevator, the B.H.P. may need to be increased slightly.

Feeding and Cutting.—In order to get the best results from a cutter it is essential to feed it correctly. A good even sample of chaff can only be obtained by keeping the mouth always continuously full. When placing sheaves in the feed trough they should be elongated, and the next sheaf overlapped so as to form a continuous flow of hay of uniform thickness into the mouth. The sheaves are best fed with heads forward. Cutting chaff from looose hay (not in sheaves) requires more activity and care by the feeder. The hay must be straightened out as much as possible to get an even thickness of flow into the mouth. It is a wise plan to practice keeping the fingers of the left hand as much as possible across the feed trough when feeding. If this is made a practise there is no danger of the fingers being caught under the roller and drawn into contact with the feed rollers.

During summer months the hay becomes very brittle on hot days. If cut while in this condition it will break up to powder and become very poor horse feed. This can be improved by sprinkling with water, either through a hose with a fine rose, or if water is not laid on, with a garden watering can, and should always be done several hours before cutting. Care must be taken not to apply excessive moisture, or the chaff may mould and become useless as horse feed. There should be just sufficient moisture to give the hay a feeling of toughness. Wet hay often will wind around the rollers, and if it is allowed to continue for a time it will cause heavy driving, with always a danger of bursting the mouth. There is little need to stress the point that chaff cut under these conditions cannot be kept.

Knives.—The chaffcutter cannot do satisfactory work if the knives are neglected. They should always be kept sharp and in correct adjustment. They will gradually leave contact with the steels on the mouth. When this is evident they should be re-set by means of the set-screws. This should be carefully done, a quarter of a turn of the set-screw making the difference between correct and incorrect setting. When correctly set they should have a slight even rub on the mouth steels from end to end, like a good pair of sheep shears or scissors. When the outer edges of the mouth steels become worn unevenly they should be taken off and reversed. The steels on the side cheeks are held by set-screws and can be reversed without disturbing any other parts. The bottom steel is riveted to the comb, which is held in the machine by two bolts. To reverse this the comb must be taken out, the rivets taken out, the steel reversed, and re-riveted. When replacing the comb, care should be taken to ensure that it fits snugly into its place and that the bolts are tightened evenly. The combs should be kept adjusted well in mesh with the feed rollers in order to prevent hay from winding around the rollers. Remember that blunt knives will use much extra power, and a bad sample of chaff will be the result. When knives are being sharpened with the file, the edge should be kept as long as possible or as near the length of the maker's edge as it can be kept. If the edge becomes very short the knives should be taken off and ground back to a longer edge.

Lubrication.—Efficient lubrication is the first essential for the successful working of any machine which has revolving spindles. A chaffcutter, when working, is always surrounded by a cloud of fine dust. This dust is always entering the bearing in small quantities. If this is left to continue for long periods without lubrication, the lubrication in the bearings will be dried out and heating and cutting will set up. The chaffcutter should have frequent applications of good lubricating oil. Special attention should be given to the reversing clutch bevel pinion on the knife wheel spindle. This pinion runs at very high speed, as it revolves in the opposite direction to the knife wheel. If allowed to run dry it will often cause a loud screaming sound. A second essential is to use a good quality oil.

General.—Chaffcutters generally are well made and of good material. If the machine is left out in the open where the rains of winter and the hot sun of summer have full play on it it will deteriorate much faster than if it is kept under a rain and sun-proof covering or roof. The effect of exposure will do more harm than the actual work on the average small farm. All bolts, nuts, and set-screws should be kept in place and kept tight, and set-collars kept in correct adjustment when wear takes place. If a bolt is accidentally broken another of correct length and diameter should be procured as soon as possible. Driving belts should not be worked too tight. There should be just sufficient tension to give the necessary adhesion on the pulley to drive the cutter. Excessive tension will only add to the driving power needed, and cause extra wear. If the foregoing hints and instructions are observed and the machine given reasonable care and management by the operator, the chaffcutter will not fail to give its owner many years of good and profitable service.

CONSTRUCTING FOOTPATHS AROUND THE FARM.

At a meeting of the Millicent Branch held on 28th February, the Secretary (Mr. L. C. Hutcheson) read the following paper:—How often is it when one is visiting farm houses the first introduction is stumbling over loose stones and stepping into mud-holes when walking along so-called footpaths? For one's own personal convenience, is it not better to have a decent entrance or a well constructed footpath? The first thing to take into consideration when making footpaths is to see that they are made high enough above the natural surface ground. The centre should be 9in. above the ground. This may sound extraordinary, but footpaths have a bad habit of sinking, and the surrounding gardens and lawns always come up sufficiently high. Nothing is worse than to have a low lying path on which water lies. The kinds of paths are many and varied and, of course, financial circumstances play a very big part in the style of path to be constructed. Perhaps the best is concrete, laid down in sections. This may be expensive, but it must be remembered the first cost is the only cost, and one which would turn out cheaper in the long run. Where one cannot afford the outlay of concrete, attention should be given to something of a cheaper method, but on no account should efficiency be sacrificed for the sake of a few shillings. There are several bitumen-like preparations on the market, and I am going to deal with the colassed footpath. Colas is an emulsion of bitumen, a patented process that can be applied cold. It is a chocolate coloured liquid of a consistency slightly heavier than water. It is manufactured from the highest grade bitumen and may be applied to either a damp or dry surface. The only tools necessary are a broom, or preferably a rubber squeegee, a watering can with a colas baffle, a shovel and a wheelbarrow. A roller is also desirable. In general, the application consists of pouring colas on the surface, drawing this out to a thin film with the squeegee and covering with screenings or clean coarse sand, and then rolling. This gives an excellent bitumen surface for the footpath. A squeegee can easily be made from any strip of rubber or leather held between two boards 18in. long, with a handle fitted. First of all, the foundation is to made. Edging of the path is most essential. Boards rot and will not last, so I recommend either stone (sawn white stone is very good) or concrete slabs. If edging is not done, no footpath will hold good, and it would only be a waste of time, energy, and money in putting down such a thing. Practically any gravel is good. The common drain bank gravel works down very well, but if limestone gravel is used a thick gritty surface must be obtained on the top. To do this two coatings of colas with ¼in. toppings or screenings must be used. When the gravel is laid down it should be dumped or rolled to obtain a smooth and solid surface. It should then be dumped and the colas applied with a squeegee, and to which the screenings should be spread quickly, and then rolled. Screenings must be put on before the colas turns black. Sweep off all loose screenings before applying the second coat. This can be done almost immediately. A third coat, this time using coarse sand, can then be applied, Altogether a surface of between ¼in. to ⅜in. of bitumen would be obtained. If any low-lying places are noticed, they can be filled up with an extra coat of screenings before the final coat of coarse sand. There is no doubt that a path made in this manner would last for many years. One need not be afraid to walk on such a path immediately it is laid, as it will not do any harm; in fact the more traffic the better the path. A brief discussion on the utilisation of lands at present covered with bracken fern followed, and the meeting closed.

QUESTION BOX.

The Sutherlands Branch meeting held on 14th March took the form of a "Question Box." Fifteen members and visitors were present, and the following questions were dealt with:—*Question:* Most profitable concentrates for milch cows? *Reply:* About 1lb. oats and bran fed with cocky chaff. *Question:* Should cows receive stable feed all the year? *Reply:* Not if there is feed in the paddocks. *Question:* Would dehorning cows be advantageous? *Reply:* It would be best to dehorn. If possible it should be done while still a calf by rubbing caustic soda on the tips of the growing horns. *Question:* Is the rigid-tyne combine to be preferred to the spring-tyne implement? *Reply:* Several members preferred the spring-tyne implement. *Question:* Would the bones of animals that have died from poison be injurious to cows? *Reply:* Bones of animals which have died from strychnine poisoning would not harm cows. *Question:* In feeding crushed wheat to horses, should one wet the chaff or the crushed wheat? *Reply:* When feeding crushed wheat, damp the chaff, but if feeding oats leave it dry. *Question:* Would barley be profitable as a rotation crop? *Reply:* Barley could be grown in the district in average years with quite good results. *Question:* Most suitable variety of oats, both from grazing and grain points of view? *Reply:* Algerian oats best for grain, and Lachlan best for feed. *Question:* Which post will stand the longest, white or red mallee? *Reply:* White mallee considered the best, but it depended on the age and quality of the wood. *Question:* Best way to destroy weevil in a barn? *Reply:* Spray with copper carbonate. *Question:* Is barley better than oats as a livestock food? *Reply:* After some discussion an extract was read from the bulletin "Popular Farming Fallacies," by W. J. Spafford. *Question:* Best variety of barley for the district? *Reply:* Cape barley was preferred. *Question:* Treatment for sitting hens infested with lice? *Reply:* One member suggested "Insectibane." *Question:* Most suitable breed of cow? *Reply:* Friesian or Shorthorn. *Question:* Cure for roup? *Reply:* 2 drops eucalyptus, 1 drop kerosene, 1 teaspoon olive oil.

CARE OF SMALL ARTICLES.

In the course of a paper read at a meeting of the McLaren Flat Branch on 5th March, Mr. W. Kyloh stated that tools were often badly neglected, and should receive more attention. The hand saw should be kept from becoming rusty by frequent rubbings with grease, vaseline or oil. The handle should receive a coat of boiled oil occasionally. Bits should be kept apart from other steel articles, otherwise the edges and points became burrel, and would not bore a clean hole. If they were well greased or oiled before being put away they would last much longer. The most common files used on a block were 10in., 12in. flat, and a 3-cornered file. The useful life of a file was usually short, but it could be considerably lengthened by keeping it from coming into contact with other steel articles, from developing rust, and by providing it with a handle. *Pumps and Wells.*—All common pumps had 2 valves, one to hold the water and one to lift the water, commonly known as suction and plunger valves respectively. On most pumps there was also a foot valve. Though a foot valve was not absolutely necessary to a pump, it was very useful, as it served two useful purposes. It prevented rubbish and small pieces of water-logged wood from getting into the pump and jamming the valves, and it assisted the suction valve in keeping the pump full of water. Good quality harness leather should be used to renew pump washers. The leather should be of even thickness, or difficulty would be experienced in making the pump airtight. In replacing the piping, thick paint or white lead should be used on the joints to prevent them from rusting. The job could then be more easily done next time.

POTATO GROWING.

At a meeting of the Ironbank Branch, held on 4th March, Mr. E. W. Mattner, of the Balhannah Branch, spoke on potato growing. He said that the ideal plot for growing potatoes was a Subterranean clover paddock which had been heavily stocked, and was well covered with animal droppings, that being the best fertilizer he knew. Any old straw or rubbish could be ploughed in also. The first ploughing should be done in July, as deeply as possible, care being taken not to bring the clay to the surface. No harrowing should be done at that stage, the plot being left rough until September, or even later if conditions were very wet. One should then cross-plough again deeply, and then cultivate every week or so, until planting. The more the ground was cultivated the better the crop would be. Just before planting the plot should be ploughed again a third time, ploughing the same way as the rows of potatoes would be planted. The ground should be cultivated down to a fine tilth, and should then be ready for planting. Planting should commence about the middle of November, and could be continued until Christmas, or even later. Where water was available for irrigation the sets should be placed 1ft. 6in. apart, and the rows 2ft. apart. For dry ground the distance should be greater—about 2ft. by 2ft. 8in. After planting the ground should be rolled and harrowed at once. The speaker had used all kinds of artificial manure, the best being a mixture of super, 4 or 6 parts, and sulphate of ammonia, 1 part. To obtain the best results this should be sown directly on the seed in the rows at the rate of 10 or 12cwts. to the acre. Carefully selected seed from the best plants only should be used, the large potatoes being cut not too small, the cut seed planted early, and the small tubers kept for later planting. When the seed was cut it should be placed into wet bags, and any seed left over from the day's planting should be immersed for a few seconds in water. A specially-made bag to hang on the hip, supported with shoulder straps, was considered the best container to use while planting. Irrigation was carried out by allowing water to run gently between the rows. After each watering the ground should be well cultivated, care being taken not to disturb the roots of growing plants. For dry ground planting could be done up to the middle of January, Carmen being the best variety where no water was available.

THE FLOWER GARDEN.

Mr. L. H. Noll read the following paper at the March meeting of the Nelshaby Branch, when 15 members and a number of visitors were present:—"The flower garden is a sideline, and, at the same time, a beautifier of the home. I am about the only one in this district who has it as a sideline. I have found it a great success—better than growing wheat. Of course, it is necessary to consider climatic conditions, water facilities, and the right kind of flowers to grow, as a lot of flowers that do well further south would do no good here. We have to go in for the more hardy sorts—something the wind cannot damage. Of course, there are very few flowers that can stand the east winds. Brush fences are fairly successful, but must not be too far apart. The sweet peas are too dainty for this district—that is, to grow them the right way. For winter, the best flowers to put in are stocks, carnations, bulbs of practically any description, the ranunculus being one of my favourites; also, anemones, Iceland poppies, and antirrhinums are also good to put in. So far I have used very little manure in the garden, and that mainly cow manure. I also use super, as it keeps the garden cleaner. Quite a lot of ashes and lime are used on the beds before digging. In summer one must have plenty of water. Dahlias, zinnias, asters, and marigolds are grown with success. Plenty of others can be grown, but one does not want too many kinds. It is better to make a success of a few. The above varieties are hardy, and have long stems, which they must have to be suitable to sell. In summer the plants must be grown in trenches, and the seeds must be sown in place, where possible, to avoid transplanting. A light mulch is needed to protect them from the hot sun, and it also keeps the moisture, thus helping to cut down the water bill. I was told that asters must be grown in a shady place. I grew mine in the open, and they could not be better. I grew the Giant Orego variety. Zinnias are a wonderful summer flower. The hotter the day—providing they have enough water—the better they bloom, and they have so many different shades. The more you cut them the more they bloom. This applies to most kinds of flowers. Many people, if they have nice flowers, are afraid to pick them, which is quite a mistake. If you want them to continue flowering you must pick off all the old flowers every week. Gladioli are beautiful flowers to grow. They receive the same treatment as other flowers, but you only get two blooms a year from them. Of course, to sell them is another matter, or they would not pay. On the other hand, the bulbs only need to be put about 3in. apart, so one can get quite a lot in a bed. Dahlias must have the stem burnt; this applies also to poppies. Dahlias are not a flower for this district at all, but, because of their beauty, I cannot resist them. They cannot stand the least bit of wind, the flowers being easily spoiled. Unless one has an extra shelter for them, also a bountiful water supply, one can only expect a reasonable success with them. They require plenty of mulch. I put fresh plants in every year, as they do best. Antirrhinums will stand two years, as will stocks, but it is safer to plant them fresh every year. Bulbs I take up every year and divide. Never plant the same flowers in the same place two years following. By so arranging that when one flower stops blooming you have the other starting one never needs to be without blooms for the whole twelve months of the year.

SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		SOUTH-EAST DISTRICT.		
Tantanoola	7/3/36	5	Formal Business	L. J. C. Osborne
Millicent	24/1/36	8	" Care on the Farm "—L. L. Hately	L. C. Hutchesson
Millicent	28/2/36	7	" Farm Footpath Construction— Hon. Sec.	L. C. Hutchesson
Mount Gambier	14/2/36	—	Discussion—Herd Testing	N. R. Aslin
Mundalla	19/2/36	16	" Fertiliser Experiments " —E. L. Milne	A. Ross
Allandale East .	13/3/36	10	Annual Meeting	R. T. Laslett
Penola	13/3/36	7	Discussion	F. W. Hinze
Rendelsham ...	12/3/36	6	Address—W. H. Downes	F. Todd, jun.
		UPPER NORTH DISTRICT.		
Baroota........	10/2/36	12	Harvest Reports	E. W. Hulster
Murraytown ...	29/2/36	7	" The Combine "—Hon. Sec.	E. B. Pitman
Booleroo Centre.	6/3/36	7	Harvest Reports	J. J. McCarthy
Appila	13/3/36	60	Address—W. J. Spafford	E. H. Wurst
Wilmington	10/3/36	19	Paper from Vic. *Journal* .	Chas. Cole
		MID-NORTH DISTRICT.		
Wandearah.....	3/3/36	12	Harvest Reports	L. A. Jacobs
Narridy	7/3/36	28	Address—J. O. Hatter ..	J. Klingner
Hilltown	3/3/36	26	Harvest Reports	L. J. Harvey
Redhill	10/3/36	10	Paper—E. E. Kellock ...	L. Harris
Nelshaby	—/3/36	15	" Flower Garden "—L. H. Noll	J. A. Lawrie
Snowtown......	13/3/36	10	Harvest Reports	A. R. Hocking
		LOWER NORTH DISTRICT.		
Penwortham ...	12/2/36	12	Formal Business	A. R. Jenner
Light's Pass ...	2/3/36	19	Address—J. B. Harris ...	C. A. Verrall
Upper Wakefield	6/2/36	—	" Care of Farm Machinery " H. W. Gregor	H. W. Gregor
Brownlow	4/3/36	13	Annual Meeting	V. G. Semmler
Rosedale	9/3/36	17	" Budding and Grafting " —Mr. Ruediger	W. Georg
Koonunga......	4/3/36	15	" How to become Efficient " —H. Mibus	H. Mibus
Stockport	15/1/36	—	Annual Social	R. V. Koch
Stockport	17/2/36	9	Address—D. L. Stribling	R. V. Koch
Hanson	3/3/36	—	Address—" Superphosphate "	M. de N. Lucas

REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
LOWER NORTH DISTRICT—*continued.*				
Truro	16/3/36	13	Harvest Reports	L. S. Davis
Sutherlands	6/3/36	—	"Marketing Problems"—Hon. R. L. Butler	L. B. Doecke
Sutherlands	14/3/36	15	Question Box	L. B. Doecke
Whitwarta	16/3/36	16	"Care of Horses"—J. Kostera	C. W. Dunow
Wirrilla	5/3/36	—	"Bulk Handling"—S. Dennison	H. Schunke
YORKE PENINSULA DISTRICT.				
South Kilkerran	2/3/36	19	"Care of Sheep"—B. W. Schulz	R. E. Hasting
Arthurton	18/2/36	13	Harvest Reports	T. H. Howlett
Boor's Plains	5/3/36	23	"Chaffcutters"—Thos. Rodda	S. G. Chynoweth
Kilkerran	9/3/36	6	Paper—C. Rechner	A. Sawade
WESTERN DISTRICT.				
Maltee	5/3/36	11	Harvest Reports	E. Schwarz
Lipson	7/3/36	11	Address—H. D. Adams	M. Barraud
Goode	4/3/36	10	Harvest Reports	B. A. Linke
Green Patch	5/3/36	9	Discussion	C. J. Whillas
O'Loughlin	5/3/36	14	Discussion	E. R. Pfeiffer
Kelly	7/3/36	—	Social and Dance	F. R. Illman
Mount Hope	10/3/36	8	Question Box	J. L. Vigar
Pygery	10/3/36	7	Harvest Reports	A. Day
Warramboo	17/3/36	8	Annual Meeting	P. E. C. Daniel
Chilpuddie Rock	11/3/36	8	Discussion	H. Brown
EASTERN DISTRICT.				
Chapman Bore	11/2/36	15	Harvest Reports	J. P. Krollig
Devlin's Pound	25/2/36	15	Address—H. V. Blackman	H. A. Loffler
Karte	12/2/36	25	Combined Meeting	M. E. Small
Karte	11/3/36	14	"Farm Horses"—D. R. Flavel	M. E. Small
Chapman Bore	9/3/36	14	"Rabbit Destruction"—B. Wohfiel	J. P. Krollig
Devlin's Pound	24/3/36	11	Address—R. L. Griffiths	H. A. Loffler
SOUTH AND HILLS DISTRICT.				
Hartley	4/3/36	17	Visit from Strathalbyn members	W. J. Brook
Narrung	7/3/36	10	Paper—A. J. Green	W. T. Lawrie
Currency Creek	11/2/36	15	"Uniformity in Fleeces"—J. Elfenbien	D. Jeff. Gordon
McLaren Flat	5/3/36	17	"Care of Small Articles" W. Kyloh	P. T. Wait
Cherry Gardens	7/3/36	11	Exhibit Night	A. R. Stone
Hope Forest	2/3/36	19	Address—H. H. Orchard	H. J. Hunter
Ironbank	4/3/36	10	"Potatoes"—E. W. Mattner	C. M. Morgan
Blackheath	12/3/36	—	"Modern Road Construction"—Mr. Abbott (Mobilong D. C.)	E. H. Paech
Monarto South	21/3/36	—	Address—Dr. Wickens	C. F. Altmann
Myponga	18/3/36	150	Address—W. J. Spafford	C. A. Martin
Inman Valley	19/3/36	36	Address—W. J. Spafford	S. F. Hacklin

WOMEN'S BRANCHES.

CONFERENCE AT OWEN.

Mrs. Wilson, of the Wasleys Branch, presided over the Conference of Lower North Women's Branches, which was held at Owen on 27th February. Miss E. Campbell, of the Education Department, gave an address, "Household Hints," and the following papers were read and discussed:—

GOOD READING.

[Mrs. A. Telfer, Clare.]

There is nothing, perhaps, that is a more universal boon to the human race than the ability to read. From the time we first discover the magic of building words from apparently meaningless letters there opens up a vista of joy, beauty, and knowledge that widens and deepens as time goes on. Always some new pleasure unfolds, some new truth is displayed, and through the medium of the printed page knowledge of the whole world is given us, and also the thoughts and experiences, the joys and sorrows of other human beings.

When books were painstakingly written by hand, and skill in the arts of writing and reading was confined to very few—and those few the priests and monks of the times—nothing was written that did not have the twofold purpose—to educate and elevate. The early writings consisted of translations of the Scriptures and of the lives of saints and, of course, were not for the ordinary people to handle, even had they so wished. In these times, when practically every one is able to read—and quite too many, we are convinced, feel that they can write—books of all kinds flood the market, not to mention newspapers, magazines, and periodicals innumerable. All that are published find readers somewhere.

The question is often asked, "Why do people read?" and various reasons are given: Some read to gain knowledge and new avenues of thought, and some as a substitute for thought.

When we are young we read because of a desire for knowledge, if we are ambitious, or from a thirst for romance and adventure. The quieter our environment the more eager the quest for the romantic and adventurous in fiction. As we grow older, and the cares of life throng around us—though life may not be a series of thrills such as the cinema and some books would have us believe—we find our tastes becoming quieter, and something restful is often welcomed, especially for the busy mother whose time for reading is limited and often combined with the necessary moments of rest.

For whatever reasons we read—and most of us, if not all, read chiefly because we enjoy it—we should not be satisfied with anything but the best. That, you say, is all very well, but how do you know what a book is until you have read it? This is where the benefit of our circulating libraries comes in. We get such a variety here at such a comparatively trifling cost. We have the opportunity of reading the most modern, as well as those not so new, and having perused or skipped through them as fancy dictates we can decide whether we will have them on our bookshelves to become our friends—for books are friends in a very real sense.

Some of the best books for young folk—and we need to be careful in guiding the tastes of our children in this—in addition to selections from the best poets, suitable travel books and biographies are by Australian authors. Where would you find a better series than the "Billabong Books" by Mary Grant Bruce, while Ethel Turner stands alone in her "Seven Little Australians" and its sequel, "Flower of the Pine." Lillian Pyke, Lillian Turner, and Jean Curlewis also delight the young folk and their elders. The books by Edward Ellis still fascinate boys and girls, and the "Anne" books by L. M. Montgomery delight girls and their elder sisters and mothers as well. Then who has not revelled in "Alice in Wonderland," "Water Babies," the "Just So" stories, and A. A. Milne's poems and stories.

In the adult section, except for those books by Ion Idriess, "Flynn of the Inland," "Lassiter's Last Ride," and a few other by the same author, also two or three written about the convict days, notably "The Term of His Natural Life" and "Pageant"—the last-named has a Tasmanian setting and is by Lancaster—"Camel Pads," and Myrtle Rose White's "No Roads Go By," I do not place the books by Australian authors that I have read in the category of "Good Reading." The writers whose works have stood the test of time like Dickens, Hardy, Charlotte Bronte, Jane Austin, and Scott in parts are still good, and worthy of a place on our book shelves.

The modern books comprise so much variety, and those that are good are very good. In fiction, to mention a few, "The Good Companions" by Priestley, "Jim Redlake," "My Brother Jonathan," "The Portrait of Claire," "White Ladies" by Frances Brett Young, "Carolyn of Scarpa" by Flora Klickman, those two beautiful and wholesome books by Bess S. Aldrith, "A Lantern in Her Hand" and "A White Bird Flying, "Precious Barneby" by Mary Webb.

Then books of travel! It is the fashion nowadays to go by air, car, or caravan, to walk or cycle over or around the world, or into remote parts of it, and come home and tell about it; and how interestingly reads the telling! So if one would travel by proxy—and most of us must be content with that—let us go over Africa, then to Europe, Asia, and back to Australia with Richard Haliburton in his "Flying Carpet"; round and about Australia with Dr. Thomas Wood in "Cobbers"; go by steamer, train and car into the beckoning horizons of China, Japan, and Russia with Sir Wedgewood and Margaret Benn; or travel with H. V. Morton trying to see all he sees in those out-of-the-way spots of beauty and tradition, history and romance throughout the British Isles and Palestine, and so one could go on.

Good reading is so diverse in its nature and purpose that one can only touch a phase or so, and the outer fringe at that. As with a beautiful flower or landscape, we can take and enjoy all that there is in good books of nobility, grandeur, beauty, and still leave it all for the enjoyment of others.

PREPARING POULTRY FOR THE TABLE.

[Mrs. E. CATFORD, Clare.]

Poultry of some kind is an appetising dish at all times, and those who wish to secure the best will find it necessary to know what points there are in selecting good, tender birds for their use, and how to treat it in preparation for cooking. It is neither as difficult nor as disagreeable as one thinks if done properly.

Poultry for roasting should be young and tender, but for boiling and stewing it may be more mature. To ascertain if the birds are young the legs and feet should be pliable, and the end of the breast-bone easily bent. A fowl is usually called a chicken until it is about 9 months old. Turkeys when young have white, smooth legs, and the skin of the body is white and clear. Old turkeys have very red legs, and the flesh is hard and tough. Young geese and ducks have very yellow and pliable feet and legs, the flesh is very soft and smooth to touch, and the under-bill is easily broken. If they are old birds the skin of the flesh is hard and dry.

The feathers are easy to pluck if, as soon as the birds are killed, they are dipped up and down into a bucket three parts full of boiling water for a few minutes—geese and ducks require a little longer time—then take the bird out of the water and wrap it in a cloth or bag to steam for a few minutes. When it is plucked clean and quite free from pin-feathers singe off the down.

To draw the bird first cut off the legs, then the neck (if desired), and cut a slit in the skin and remove the wind-pipe and crop with the fingers and pull it out whole, taking care not to break it. Now make a slit crossways, just under the tail, being careful not to interfere with the intestines. Insert the fingers and grasp the gizzard and draw everything out, being careful not to break the gall-bladder; if this should happen wash the bird out with warm water immediately and dry thoroughly. Save the giblets, as these are delicious for soup or gravy and served in many other ways.

Wash the bird and it is ready to be stuffed, trussed, and tied for roasting. Place the bird breast downwards into the baking dish for a while, and then turn it on its back later on when the juices have run into the breast. This prevents dryness of the flesh when it is cooked.

If a turkey or any large bird is too big for the oven the bony frame of the back can be removed easily with a sharp knife by making a slit in the skin from the neck to the tail; then cut the flesh and scrape it from the bone to the ribs on either side, breaking through the wing and leg bones, leaving these bones intact. Break through the ribs and remove the large backbone, but leave the breastbone, wing, and leg bones in the bird.

When the bony frame is removed from the back of large birds, and then well filled with seasoning or force-meat and sewn up again to resume the shape and size of an unboned bird, it makes it possible to cook a large bird comfortably, and also to carve and serve more easily.

When the birds are prepared cover with greaseproof paper, bake slowly to preserve the juices, and baste frequently with a good supply of hot dripping. A sprinkling of flour and salt helps to brown the birds nicely, and removing the greaseproof paper about half an hour before serving also helps the browning.

The time for cooking a large turkey is about 2½ to 3½ hours slow cooking, and geese and ducks require about 1½ to 2½ hours, according to size and age of the birds.

Old fowls, when boiled slowly, are made tender by the moist and slow method of cooking, also if a little vinegar is rubbed over the fowl it will help to make the flesh tender. There are several ways of dealing with old birds to make them appetising. An "old hen" can no longer be despised if dished up in some of the following ways:—(1) A very nice dish can be made by boiling an old fowl until it is tender, then take out all the bones, and when cold mince it up with some ham or bacon, season with thyme, pepper, and salt, and mix together with a beaten egg. Fry in breadcrumbs until a nice brown, and serve with gravy as for rissoles. Boil the fowl until tender, then put it into a baking dish with dripping, and serve with baked batter pudding, vegetables, and gravy. Gently simmer a fowl in a saucepan with a sliced onion, a pint of water, and some dripping. When it is cooked allow to cool, then cut off slices of meat and dip them in flour and place them in a piedish in layers with a few slices of ham or bacon. Add pepper and salt to taste, and sprinkle some finely-chopped parsley over each layer. When the dish is full pour over it some good stock or the liquor in which the fowl was boiled. Cover with some short pastry, and bake for ½ hour. Serve hot with vegetables.

To make stuffing for geese and ducks:—Boil some onions until they are tender, then strain and mince them with a fork on a dish. Add some breadcrumbs, pepper and salt to taste, and a few crushed sage leaves, a sprinkle of thyme, and a dessertspoonful of butter or dripping. Mix all together and stuff the breast and body, sewing the opening so that the seasoning will keep intact while it is cooking.

For turkeys and fowls the seasoning is made with breadcrumbs, thyme, salt and pepper to taste, and a grated lemon; mix together with a beaten egg. To stuff the breast of a turkey fill it with forcemeat, and sew the slit in the skin. When serving the turkey the sliced pieces of breast are very helpful to make this supply go further, especially at a large gathering when more is needed. Boiled ham or fried bacon should be served with all poultry.

There are several ways of using up cold poultry that is left over, and the following are some recipes that may be very helpful when one has got some pieces of meat on hand.

LEFT-OVER POULTRY PIE.

Remove all the bones and cut up the pieces of meat and scraps of seasoning. Line a baking dish with pastry or batter, and put the pieces into the dish with a sliced onion. Pepper and salt to taste, and a spoonful of Marmite or stock and a little chopped parsley. Sprinkle some breadcrumbs over the top, and add a few small pieces of bacon. Put into the oven, and bake until a nice brown. Serve hot with fried tomatoes or other vegetables.

JELLIED POULTRY.

Cut up pieces of cold cooked poultry, and put into a basin or mould. Mix separately a dessertspoonful of Marmite or good gravy with some boiling water, add some dissolved gelatine, and season to taste. Stir well together, and pour it over the meat, then place it in a cool place to set. Turn it out on to a plate, serve with slices of cold bacon or ham, and garnish with parsley. This is also a delicious filling for sandwiches.

KNITTING.

[Miss K. M. KOCH, Clare.]

Knitting is one of the most fascinating pastimes for winter evenings, and many useful garments as well as toys and novelties can be made. For summer jumpers, underwear, and infants' wear 2-ply wool is most suitable, but for winter jumpers, cardigans, scarves, cosies, cushion covers, &c., 3 or 4-ply is required. Odd scraps of left-over wool may be made into gay cushion covers for the breakfast room or verandah.

There are only two stitches used in knitting—plain and purl—and it is just a matter of how they are put on the needles that makes a pattern. When these two stitches can be made, it should be possible to follow any directions and be able to accomplish any garment, no matter how intricate the pattern. Stocking stitch is the most commonly used—this being obtained by knitting one row and purling the next. For summer jumpers, a more open pattern is essential, and many pretty lacy designs may be found in some of the knitting books. Fancy ribs have now become very popular for winter cardigans. For men's and boy's pullovers and cardigans—both cream and coloured—nothing is more popular than the cable stitch.

HINTS TO KNITTERS.

Wool should never be wound into a hard ball; this stretches it and makes it thin and poor. Wind loosely over three or four fingers and the wool retain its softness.

In commencing the first row always knit into the back of the stitch, and a firm edge will result.

When starting a garment always cast on a few stitches and knit three or four rows to see what tension you knit. If you do more stitches to the inch than the pattern indicates less will be required for the garment.

To keep the work smooth and even be careful to knit the same tension all the time.

Do not leave the work in the middle of a row or poke the needles through the knitting; the latter will make holes.

When starting a row always slip the first stitch.

If using two colours do not draw the wool on the back too tightly.

To keep white knitting clean rub the hands occasionally with talc.

When working a large pattern with several colours it is better to work each section of the pattern with a separate small ball of wool to avoid carrying the wool across the back of the work.

A great help to indicate where stitches have been decreased is to knit in a coloured thread at the decreasing row, which can be pulled out easily.

Before making up a garment press all pieces thoroughly with a damp cloth and a hot iron.

When using different wools, to prevent them from becoming knotted, place in a cardboard box and pierce as many holes in the lid as there are balls of wool, and thread through the holes.

When buying wool for a garment always buy sufficient to finish it, or there may be some difficulty in obtaining the same shade again.

To join wool neatly darn one end into the other.

When buying knitting needles choose a contrast colour to the wool that is being used as it is not so trying to the eyes.

CONFERENCE OF WOMEN'S BRANCHES AT BEETALOO VALLEY.

Mrs. P. Curtin occupied the chair at the Conference of Mid-North Women's Branches of the Agricultural Bureau, held at Beetaloo Valley on 12th March. Delegates and visitors to the number of over 100 were present from Belalie, Wirrabara, Narridy, Gladstone, Nelshaby, Georgetown, and Beetaloo Valley.

Addresses were delivered by Miss E. Campbell (Education Department), and Messrs. H. B. Barlow and C. F. Anderson, of the Department of Agriculture.

The following papers were read and discussed:—

CITRUS FRUITS AND THEIR USES.

[Mrs. D. Brooks, Belalie.]

Of all articles of diet, probably fruit has the most important claim to general use, with its abundance of those vitamins which are most essential to human growth and well-being. Of all fruits, possibly those belonging to the group known as citrus fruits would be considered the most important and indispensable. To this group belong Oranges, Grape-fruit (described in the dictionary as a form of orange that grows in clusters), and also known as the Shaddock, the Bitter Orange, the Seville and Poorman's varieties, Citrons, Lemons, and Limes. Oranges have been described as "stored sunlight," and when one pictures a tree in full bearing one can quite appreciate the description. They are said "to supply all valuable minerals to build strong teeth and bones, rich blood, nerve tissue, and help to regulate the body. They stimulate the appetite and aid digestion."

In a country like ours, the natural home of such fruit, it would be a sin if the claims of these wonderful gifts of Nature were ignored or overlooked.

The first form of diet prescribed as additional to the natural feeding of an infant is the juice of an orange, and as the child advances to more mature development, not only do the oranges still perform a great function in nourishing and regulating his body, but they should be given in ever increasing proportions.

Even as the saying, "An apple a day keeps the doctor away" has a deal of truth in it, so we might apply the statement to oranges with equal force and suitability.

The lemon, too, in its raw state has great medicinal as well as appetising value. It is being increasingly used for the wonderful properties of its juice, and to some palates is even welcome as a fruit.

Both oranges and lemons are greatly appreciated when used in the making of cooling summer drinks. The lime, too, is used commercially for lime juice.

The grape-fruit is a recognised breakfast dish, being a particularly useful fruit to open a light meal. The other varieties of citrus fruits are mainly used in jams and preserves, and may be dealt with as a group rather than singly.

MARMALADES AND SWEET CITRUS JAMS.

Make sure that all the fruit is very fresh and not over-ripe. Always soak and cook the fruit until the skin is completely tender before adding the sugar and remember that the sugar, when added, immediately hardens the fruit. Boil all jams steadily and evenly, and bottle while hot. Place in clean dry bottles, and keep, when sealed, in a cool place.

Sweet orange fruit—especially when kept a while before using—is a welcome addition to the jam supply, being palatable even to those who do not care for marmalades. All forms of citrus fruit may be used in the making of marmalades, and if the fruit be good, the method of making seems to be capable of wide variations, both as regards time and quantities of sugar and water to be added.

The grated rinds of the different fruits may all be used with good effect as flavourings, particularly in cakes and puddings.

THE LEMON.

The lemon clears the throat, sweetens the breath, keeps the gums in a healthy condition, and is excellent for internal disorders, such as biliousness. The lemon is also a valuable toilet requisite, and if the hands need to be cleansed of stains, a little lemon juice will do the work. Brass and copperware take an added lustre when cleaned with lemon juice, while it will make still whiter a scoured table or sink. Lemon juice and milk applied freely to ink stains will completely remove those stains.

Another attractive use of these fruits is in removing the skins in halves and using them as baskets for jelly, fruit salads, or any other mixtures we wish to dispense. These are particularly suitable for a children's party.

There is a variety of ways in which slices of lemon may be used for garnishing purposes. A fish dish is improved both in appearance and flavour if slices of lemon are served with it. A slice of lemon floating on a finger bowl is a dainty as well as useful addition to that useful article. In many prepared drinks, too, slices of lemon add much both to flavour and attractiveness.

CANDIED PEEL.

Make a brine by boiling 1 pint of water and ¼ cup salt. Cut oranges, lemons, or citrons in halves. Pour the brine over them, and allow to soak for 3 days. Lift out, and drain on a wire drainer for about 24 hours. Make a syrup by boiling together for 10 minutes 1½lbs. sugar and 1½ pints water. Remove the pulp from the skins without bruising the skins. Place skins in the boiling syrup, and boil very gently for 20 minutes. Allow to stand in the syrup for 12 hours. Then repeat the same process every day for 3 days, soaking for 12 to 24 hours each time. Drain from the syrup, and allow to dry on a wire drainer. Sprinkle with sugar, and, when quite dry, pack in airtight jars.

GRAPEFRUIT JAM.

Cut the fruit into slices, not too thinly, and remove any seeds. Allow 3 pints of water to each large grapefruit. Pour this over the fruit, and allow to stand for 24 hours. Bring to the boil, and strain away the liquor, measuring it. Replace this with fresh hot water, and allow to stand for another 24 hours; then boil steadily, without stirring, until the fruit skin is quite soft. Weigh this, and allow 1lb. of sugar to each 1lb. of pulp and liquor. Make the sugar hot, and have the pulp boiling before putting together. Boil steadily until it will jelly. Bottle while hot, and seal when cold.

MANDARINE CONSERVE.

Use thin-skinned mandarines. Cut them in halves, and remove the seeds. To each quart of fruit allow 1 pint of water. Allow to stand again for 24 hours.

Weigh the pulp and liquid, and allow 1lb. of sugar to each 1lb. of pulp. Cook about 1 hour, or until syrup thickens. Bottle while hot and seal when cold. Keep for some time before using.

ORANGE RINGS.

Cut large ripe navel oranges into 4 thick rings. Cover them with a brine made by boiling ½ cup of salt and 1 quart of water. When quite cold pour over the fruit, and allow to soak for 48 hours. Drain, wash and cover with fresh unsalted water, and stand again for 48 hours. Drain and weigh the fruit. Cover with fresh, cold water in the preserving pan, and bring very gently to the boil. Cook without disturbing until the fruit is soft enough to rub the skin to a paste in the fingers. Lift rings out carefully with a wire lifter, taking care not to break them. Drain carefully. Make a syrup by boiling sugar and water in the proportion of 1lb. sugar to 1 pint of water in which the rings have been boiled. Allow this quantity to each 1lb. of the fruit. Bring the syrup to the boil. Lay the rings in it. Boil steadily without disturbing until it will jelly. Place the rings in wide-necked jars. Cover with the syrup. Seal when cold, and keep for some time before using.

ORANGE TART.

Puff pastry, 3 eggs, 3 oranges, 4ozs. sugar, 3ozs. butter. Beat the yolks, add the sugar, rind, and juice of oranges, melted butter, and then the beaten whites. Make the pastry. Line a deep plate or sandwich tin. Pour in the orange mixture. Bake in a hot oven until set and brown. Serve cold with cream or custard.

STEAMED ORANGE PUDDING.

2ozs. butter, 2ozs. sugar, 1 egg, rind and juice of 1 orange, 4ozs. S.R. flour. Cream the butter and sugar; add well-beaten eggs, then juice and rind, lastly well-sifted flour. Pour into a well-greased mould. Cover with greased paper. Place in a steamer. Steam for 1½ hours. Turn on to hot dish. Serve with orange sauce.

ORANGE SAUCE.

6 tablespoons orange juice, 6 tablespoons water, rind 1 orange, 1 tablespoon sugar, 1 heaped dessertspoon arrowroot, 1 teaspoon butter. Boil the water, juice, rind, sugar and butter; then pour on to blended arrowroot. Return to saucepan. Stir until it boils and thickens. Pour into hot sauceboat. Serve with steamed or boiled pudding.

ORANGE JELLY MOULD.

3 oranges, 3 gills stiff lemon jelly, ½ pint cream, 2 tablespoons sugar, ¾oz. gelatine, 1 gill milk. Divide the fruit into quarters after peeling and removing all pith. Line the bottom and sides of a plain mould with jelly. Lay in the orange quarters. Cover with jelly, and allow to set well. Whip the cream, add the remainder of jelly and the milk, in which the gelantine has been dissolved. When beginning to set, pour into the mould. Leave on ice until filling sets. Turn out on to glash dish. Garnish with whipped cream.

ORANGE FRITTERS.

Oranges, sugar, fritter batter, frying fat. Peel oranges, remove all pith, cut into slices. Lay on a plate and sprinkle with sugar. Make the batter in the usual way. Dip slices of orange in batter, then into boiling fat. Fry till a golden brown all over. Drain on white paper. Serve at once, sprinkled with sugar.

ORANGEADE.

4 oranges, 1 quart water, 2ozs. loaf-sugar. Wash the oranges and dry well. Rub sugar on the outside of the oranges until all the oil is extracted, then peel very thinly. Put half the rind, juice and sugar into a jug. Pour on boiling water. Cover and leave until cold. Strain at once. Chill, and serve.

ORANGE ICING.

8ozs. icing sugar, 2 tablespoons orange juice. Sift icing sugar into a basin, add juice, mixing to a thick consistency. Warm over the flame until thin enough to pour, but it must not boil. Pour over the cake. Leave until cold before cutting.

ORANGE CHEESE.

2 eggs, 8ozs. sugar, 4ozs. butter, rind and juice 4 oranges. Beat eggs well, add sugar, oranges and butter. Cook over boiling water until thick, stirring occasionally. Bottle at once. Use as filling for tarts or cakes.

ORANGE CURLERS.

8ozs. plain flour, ½ teaspoon baking powder, 3ozs. butter, 1 dessertspoon sugar, 2 tablespoons water, jam, frying fat. Sift the flour and baking powder, rub in butter, add sugar. Make into a dry dough with water. Roll out ¼in. thick, cut into rounds 2in. in diameter. Place ½ teaspoon jam on a round, wet edge, cover with another round. Press edges well together. Wet fry till a golden brown. Drain on paper. Sprinkle with sugar, and serve very hot.

SOME OF THE USES OF CITRUS FRUITS.

[Miss J. Halse, Beetaloo Valley.]

As the production of this particular kind of fruit has so increased in recent years, it is only natural that the various uses it may be put to increase accordingly, and as this district is recognised as one of the citrus-growing centres of the north, the subject should be of interest to the women at this Conference.

Oranges, the most popular of citrus fruits, are of very great value if eaten as fresh fruit. If this were done to a greater extent it would not only provide a better market for the quantity produced, but would be of very great benefit, for children especially.

The Navel orange is used mainly for eating in the raw state, but a very nice marmalade can be made from it also, as well as it being one of the main ingredients of the ever-popular fruit salad.

MARMALADE.

The most common marmalade for household use is made from either Poorman oranges or citrons. If the fruit is picked before it is fully coloured the marmalade is a lighter colour. Recipe for Poorman marmalade:—4lbs. oranges, 4 lemons, 16 cups water, 12lbs. sugar. Method:—Cut fruit very thinly, put in pan, and cover with water over night; boil 1 hour without sugar and 1 hour with sugar.

The Citron is more bitter than the Poorman orange, but it makes excellent marmalade. The most suitable recipe is:—Slice fruit very thinly, and remove all seeds. To every pound of sliced fruit add 2 quarts water (cold), and let stand for 24 hours. Then boil quickly for 2 hours, or until tender. Next day weigh, and to every 1lb. of fruit add 1lb. of sugar and boil until it will jelly. Seeds can be set in water, and jelly used from them.

LEMONS.

This fruit may be put to a multitude of uses, but is mainly used for drinks, especially in summer. Lemons are also a very valuable remedy for colds. The lemon has its other minor uses, such as juice for cleaning hands; a few drops in the rinsing water after washing hair leaves the hair soft; juice added to blue rinsing water when washing white silk will keep the silk white. For cleaning aluminium pans, if they become black, dip a soft cloth in the lemon juice and apply; afterwards rinse in warm water. For freshening stale vegetables soak for 1 hour in water to which the juice of a lemon has been added. Lemon juice in hot coffee will relieve headaches. It also has many table uses.

To candy peel of either lemon, orange or citron:—Place peel in salt and water for 4 days, changing water daily. Then boil peel until soft and drain. Make a thin syrup with 1lb. sugar and 1 quart water. Boil peel in this until clear. Make a thick syrup, add peel, and boil slowly until syrup candies. Dust peel with castor sugar, and leave in a warm oven over night.

THE VALUE OF WHEAT MEAL IN THE HOME.

[Miss IDA PEARCE, Beetaloo Valley.]

The wheat grain has three parts:—(1) Bran, or outer covering; (2) germ, or young plant; (3) kernel, or store of food for the germ. The bran and the germ are both removed in milling in order to obtain a white flour, which is made from the kernel. This entails considerable loss of protein, fat and mineral matter. Flour, as prepared by milling, consists of 57.8 per cent. starch, 9.5 per cent. protein, 1.3 per cent. water, 3 per cent. mineral salts, 5.2 per cent. fat, thus leaving 11.5 per cent. in the germ and bran. The bran is a useful laxative, so by using the whole meal one obtains the full value of the wheat. The wheat grown on farms could be used, and expense saved in buying other foods in its place.

It can be used in so many different ways that it becomes very desirable. Mixed with flour, it makes lovely bread; scones and biscuits. When boiled it makes delicious porridge, while baking it with treacle makes a refreshing drink.

To make wholemeal bread, use two-thirds plain flour and one-third wholemeal. For scones use 3 cups S.R. flour to 1 cup wholemeal; and for biscuits, 2 cups S.R. flour to 1 cup wholemeal.

To make coffee, sift enough meal to comfortably fill an ordinary-sized baking tin with the coarser grains, using the fine for porridge. Bake the coarse meal, stirring occasionally to prevent burning, and when light brown pour on 1 cup of treacle. Keep well stirred, as the treacle burns easily if the oven is too hot. When it is a fairly dark-brown it should be allowed to cool, when it can be crushed quite easily with a bottle or rolling pin. Kept in airtight tins, it loses neither value or flavour. To prepare the coffee, use 2 teaspoons to every cup of water. Boil for a few minutes, add some milk, sugar, and a little salt, and bring nearly to the boil again. After the coffee is drained the grains can be eaten with cream and sugar. They are a special favourite with children.

"A Week's Menu" was the subject of a paper contributed by Miss D. Noble, of the Nelshaby Branch, which enumerated a menu for each meal for each day of the week.

Miss D. Jose (Nelshaby) chose as the title of her paper "A Spring Menu." She prefaced her article with the following hints:—

1. See that the dishes chosen are perfectly balanced and seasonable.
2. Bear in mind any whims or fancies among the family. "Food faddists" abound to-day.
3. Arrange menu to suit stove, saucepans, and time-saving appliance available.
4. Study the marketing list intelligently, in order not to squander money.
5. Aim for a touch or originality, and vary dishes as much as possible.
6. The principal ingredient used for one dish should not appear in any other.
7. Two dishes of a similar nature should not appear on a menu.
8. Plan well ahead.

Miss Jose then gave a menu for week-day meals, followed by a number of recipes.

SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			WOMEN'S BRANCHES.	
Laura Bay	11/2/36	7	" Dressmaking "—Hon. Secretary	Miss T. E. Barnett
Warramboo	28/2/36	11	Formal Business	Miss J. P. Patterson
Wasleys	5/3/36	20	Competition—Preserves	Miss G. Harding
Saddleworth	3/3/36	11	" Jam and Jelly Making "—Miss E. Frost	Miss G. E. Frost
Hope Forest	5/3/36	15	Biscuit Competition	Miss M. E. De Caux
Narridy	7/3/36	34	Address—J. O. Hatter	Miss B. J. Reynolds
Echunga	4/3/36	16	Question Box	Mrs. F. Dennis
Boor's Plains	5/3/36	20	" Home Crafts "—Mrs. H. Queale	Miss L. Stanway
Penola	3/3/36	36	Social Afternoon	Mrs. F. J. Kidman
Balumbah	4/3/36	10	Social Afternoon	Miss H. D. Jericho
Devlin's Pound	25/2/36	7	" Women and Public Affairs "—Mrs. S. A. Smith	Mrs. J. L. Loffler
Sheoak Log	5/3/36	31	Address—Sewing Machines	Miss K. M. Koch
Clare	7/3/36	50	Exhibition and Competitions	Mrs. A. C. Pollock
Rendelsham	4/3/36	13	" Home-made Articles "—Tantanoola Members	Mrs. W. Bignell
Auburn	28/2/36	20	Question Box	Miss L. J. Dennison
Morchard	25/2/36	50	Visit from Belalie Members	Miss F. Brown
Mudamuckla	29/2/36	17	Annual Meeting. Trip to Smoky Bay Beach	Mrs. C. H. Kuhlmann
Belalie	10/3/36	37	" Interior Decoration "—S. Gooden	Mrs. E. L. Orchard
Pinnaroo	6/3/36	10	Formal Business	Miss N. A. Mattiske
Parilla	19/2/36	19	Address—Mrs. H. Billing.	Mrs. A. W. Welden
Coonawarra	11/3/36	30	Paper—Mrs. Kain	Miss O. A. Lear
Nelshaby	5/3/36	15	Debate	Miss A. M. Lawrie
Yandiah	11/3/36	14	Address—W. J. Spafford (combined meeting)	Miss V. Keller
Maltee	5/3/36	12	" Sponge and Layer Cakes" Miss R. Talbot	Mrs. J. A. Ferguson
Pygery	10/3/36	—	Paper—Mrs. M. E. Heath	Mrs. A. R. Kammermann
Pinbong	7/3/36	10	" Rearing Chickens "—Mrs. F. Rehn	Miss D. M. Scholz
Gladstone	17/3/36	32	Conference Delegates' Reports	Mrs. L. J. Sargent
Wirrilla	6/2/36	—	Exhibition	Mrs. W. R. Jones
Wirrilla	5/3/36	—	" Articles made from Sugar Bags—Miss Macklin-Shaw	Mrs. W. R. Jones
Balhannah	18/3/36	21	Address—Sister Inglis	Mrs. D. Camp
Monarto South	21/3/36	—	Address—Dr. Wickens	Mrs. F. W. Liebelt
Parilla	18/3/36	15	Competition—Sugar Bag Articles	Mrs. A. W. Welden
Wilmington	13/3/36	29	" Uses of Tomatoes "—Mrs. Pengilly. " Conveniences in the Home "—Mrs. A. Hampel	Mrs. P. Cole
Wirrabara	19/3/36	30	Needlecraft "—Miss H. Watt	Mrs. E. Harding
Karte	11/3/36	20	Demonstration—Mrs. Atze	Mrs. F. N. Atze
Snowtown	5/3/36	24	" Biscuits "—Mrs. T. Jenkins. " Cake "—Mrs. P. H. Wheaton	Mrs. A. R. Hocking
Morchard	25/3/36	100	Annual Show	Miss F. Brown
Auburn	27/3/36	38	Homecraft Exhibition	Miss L. Dennison
Kangarilla	19/3/36	5	Discussion	Mrs. C. Steer
Narridy	24/3/36	27	Address—Miss Clarke	Miss B. Reynolds

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All communications to be addressed:

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, 1936.

River Murray, at Block E, Thursday, 18th June (Mr. J. O. K. Brigham, Box 65, Renmark, Secretary).

Upper North, at Eurelia, Wednesday, 15th July (Mr. E. S. Wall, Eurelia).

Murray Lands (west), at Karoonda (Yurgo Branch), Tuesday, 21st July (Mr. H. M. McKenzie, Yurgo).

Pinnaroo Line, at Pinnaroo, Thursday, July 23rd (Mr. H. L. Badman, Pinnaroo).

Eyre's Peninsula (east), at Kimba (Kelly Branch), Tuesday, 4th August (Mr. F. R. Illman, Box 64, Kimba).

Southern, at Inman Valley, Thursday, 20th August (Mr. S. F. Hacklin, Inman Valley).

Murray Lands (east), at Alawoona, Tuesday, 6th October (Mr. Angus Thomson, Alawoona).

Fruit (non-irrigated), at Greenock, Tuesday, 3rd November (Mr. A. Schubert, Greenock).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Pruning Competitions.

McLaren Flat, 30th May.

River Murray Branches—

Mypolonga (to be fixed).
Berri, 23rd June.
Barmera, 24th June.
Moorook, 25th June.
Cadell, 30th June.
Waikerie, 1st July.
Championship at Mypolonga, 3rd July.

Grain in Argentina on 1st March, 1936.

The report of the Department of Agriculture and Commerce of Argentina on the position of grain in that country is to hand, and from it the Director of Agriculture (Mr. W. J. Spafford) has made the following extracts:—

The area seeded to maize is estimated at 18,846,100 acres, and although the damage by locusts was great and was persisting at the time, it continued to look as though the yield per acre would equal that of last year. If this assumption is correct, the total yield will be about 455,500,000bush., for the average yield was about 24bush. 10lbs. per acre last year. After a normal deduction for seed and domestic consumption of 51,300,000bush., there will be quite 400,000,000bush., surplus for export. Besides this enormous quantity of maize available for export, there were still about 62,000,000bush., of last year's crop unsold on 1st March.

Although the normal wheat crop of Argentina is about 260,000,000bush., of which about 163,000,000bush., are exported, the drought experienced during the wheat-growing season was so severe that the 1935-36 crop was estimated to yield 145,000,000bush. only. There was a carry-over from the 1934-35 crop of about 19,000,000bush., so that after allowing for 96,000,000bush., for seed and domestic requirements, this year's surplus for export will be down to about 68,000,000bush. The exports of wheat and flour to the end of February reduced the surplus for export to about 68,000,000bush., on 1st March, 1936.

The linseed crop was also affected by drought, and instead of a normal crop of about 73,000,000bush., the 1935-36 yield is estimated to be about 54,000,000bush. Including the carry-over, making the allowance of 78,400,000bush., for seed and domestic requirements, and subtracting the exports to the end of February, there were still about 38,000,000bush., of linseed available for export at that date.

All of the winter and spring-growing crops of Argentina were affected by drought, and the quantities over and above local requirements are less than usual, with the exception of rye, but this appears to be due to the fact that there was a very large carry-over from the previous season.

The oat crops produced about 27,500,000bush., and of this quantity about 25,300,000bush., are required for seed and domestic purposes, but with the carry-over and because of the small amount sold to the end of February, there were just over 3,000,000bush., of oats as a surplus.

About 21,000,000bush., of barley were harvested, and because of a low local requrement of about 630,000bush., and a fairly heavy carry-over, there were about 19,000,000bush., still available for export at the end of February.

The yield of rye was low, only reaching about 5,700,000bush., but the carry-over was nearly equal to this amount, and seed and domestic requirements are only about 2,000,000bush., and so at the end of February there was the large surplus of about 9,000,000bush., not required in Argentina.

Canary seed, which has become important in Argentina, got a setback from the drought also, and the yield was brought down to about 960,000bush., about half of which is required locally, and after all allowances are made, the surplus for export at the end of February was about 650,000bush.

Millers' Prize for Wheat Crop Competitions.

Mr. R. F. Harry (Secretary of the Millers' Produce Company of South Australia, Limited) has intimated that his company has decided again to offer a millers' prize of £5 5s. to each of the districts conducting wheat crop competitions under the control of the Department of Agriculture. The prizes are offered on identically the same terms as those of last year, *i.e.*, that the only wheats ineligible for purposes of the Millers' prizes are Gallipoli, Free Gallipoli, Ghurka, Nabawa, and Waratah.

The inclusion of these prizes contributed to the revival of interest in crop competitions which was noticeable last year. District Secretaries have been informed of this offer, and individual members of Branches are asked to co-operate with Secretaries for the purpose of making further increases on the list of competitors. The highest number of entries was in 1928, when 634 crops were exhibited to the judges. In 1935 there were 407 entries; this number was, however, an increase of 79 over the 1934 entries.

AGRICULTURAL INQUIRIES.

[Replies supplied by W. J. SPAFFORD, Director of Agriculture.]

Availability of Superphosphate.

Clarendon Branch asks: "If an inch of rain falls shortly after superphosphate has been broadcast will the superphosphate be absorbed by the soil or will a quantity remain to be absorbed later?"

Reply—The principal constituent of superphosphate, from an agricultural point of view, is the calcium phosphate, and this is soluble in water, and provided it is kept in contact with water for some little time, all of it is dissolved. If the inch of rain is received from a steady downpour practically all of the water-soluble phosphate will be dissolved and sink into the soil, but if the rain shower is very heavy and of short duration the chances are that only portion of the calcium phosphate will be dissolved.

After the calcium phosphate has been absorbed by the soil, most of the gypsum in the superphosphate is left on the surface of the soil for a considerable time before it sinks in.

Top-Dressing.

"Is top-dressing as beneficial in a light rainfall as in a heavy rainfall district?"

Reply—In most countries soils of low rainfall districts are relatively more fertile than similar types of soils in heavy rainfall districts. This is also the case in South Australia, for most mineral plant foods except phosphorus, and practically all of our soils are equally deficient of the substance. Because of the extreme shortage of phosphorus in South Australia, applications of superphosphate have relatively similar beneficial effects on soils of similar type in low and high rainfall districts, up to the limits of growth controlled by climate and soil. Land in high rainfall districts capable of carrying 1 sheep per acre per year without manure might be made to carry 4 sheep per acre per year by annually top-dressing with 3cwts. superphosphate per acre, whilst land of the same type in a low rainfall district which would carry about half a sheep per acre per year might be brought up to a carrying capacity of 1½ sheep per acre per year by using 1cwt. superphosphate per acre each season. In both cases each 1cwt. of superphosphate would lead to an increased carrying capacity of 1 sheep per acre per year. It must be remembered, however, that there is a minimum average annual rainfall below which it is impossible to expect economic returns for the use of top-dressing of any kind.

HORTICULTURAL INQUIRIES.

[Replies supplied by A. G. STRICKLAND, M.Agr.Sc., Chief Horticultural Instructor.]

Maturity of Apples for Export.

Longwood Branch of the Agricultural Bureau: "How can a grower tell when an apple is 'too forward' for export?"

Reply—Apples must be landed on overseas markets before they reach full maturity, in order that the consumer on the other side of the world may get fruit which will develop full flavour, and be subject to no defects, such as internal breakdown. To make this possible, fruit must be picked at correct maturity, and if not to be placed on shipboard almost immediately, the fruit must then be held under cool conditions, which will retard further ripening—preferably in cool store. It should be realised that fruit held in warm sheds will ripen far more quickly than it would if left on the tree.

The best guide to maturity of apples is the ground colour of the skin; in a red apple like Jonathan, no attention should be paid to the red blush (except in regard to colour requirements), and the fruit should be picked when the green, unblushed portion of the skin is showing the faintest suspicion of yellow. If the ground colour is definitely yellow, at picking time, or at the time of packing, the fruit is then definitely "too forward" for export. As apples which are packed and held at warm temperatures ripen fairly quickly, fruit may easily appear in prime shipping condition at the time it leaves the grower's property, and yet be definitely too forward at the time of inspection and loading on ship.

Green apples such as Cleopatra and Granny Smith should be picked when the dark-green ground colour is taking on a lighter shade of green; here again, definite yellowing of the skin and softness of the pulp indicates over-maturity, and necessitates rejection of the fruit.

If care is taken to pick fruit at optimum maturity, as indicated above, and to hold it under the coolest possible conditions until it is placed in cool store or on board ship, growers should experience very few rejections on the grounds of over-maturity.

Apple Tree Stocks.

Clarendon Branch of the Agricultural Bureau asks: "Will a graft on the apple make any difference to the fruit produced if different stocks are used, and will the trees produce fruit true to type and flavour?"

Reply—It is well known that the particular root stock on which an apple variety is worked has definite influence on the growth and form of tree produced. The stock may affect type of growth, size of tree, and the time at which the tree comes into bearing. In England investigations on stock have been proceeding for many years at the East Malling Research Station, and a huge volume of information is available in regard to stock-scion relations. For instance, apple stocks have been standardised and classed as dwarfing, semi-dwarfing, vigorous, and very vigorous. In England, it is now possible when ordering apple trees, to specify a stock according to the type and size of tree desired.

Apart from the influence of rootstocks on growth, vigour, and cropping of trees, it has also been shown that roostocks may have a direct effect upon size, colour, and keeping quality of fruit produced. Furthermore, Dr. Wallace, of Long Ashton Research Station, has recorded the fact that under similar environmental conditions, rootstocks may occasion differences in the chemical composition of the fruit, and hence differences in quality and flavour.

Much work remains to be done upon the question of rootstock influence on type, quality, and flavour of fruit; however, there is ample evidence of the existence of such effects.

Agent-General's Report.

The Agent-General in London (Mr. C. F. G. McCann) reports on 17th April:—"Early arrivals of Australian apples are meeting with greater competition than is usual. There is quite a lot of Winesaps and Newtown Pippins from North America still in store, the former attractive only because of its wonderful colouring, and the last-named a real good utility apple. Argentine, too, is becoming a factor as an early apple supplier. Her ripening season is identical with ours, but her voyage of only 16 days gives her fruit the opportunity of arriving about three weeks before our first shipments, and this year's crop contains some magnificent Jonathans. South African apples are in greater evidence than usual, and are of good quality. A variety unknown to me, and which I have no recollection of having seen before, is attracting some attention, viz., Laxton Superb. This apple resembles a Jonathan in 3/4 colour, and the flavour is distinctly Cox Orange Pippin. Retailers tell me that they are getting repeat orders for this apple, as consumers like its flavour. Those I sampled were particularly good. The market is low. The abnormally cold weather, with ice, snow, sleet, rain, and, lastly, fog, is not at all conducive to an increase in apple consumption. It is hoped that, with the resumption of seasonable weather, a much better demand for apples will be stimulated. There is not much wrong with our fruit, and the Chief Horticultural Instructor and his officers are to be congratulated upon their care and attention in the supervision of the shipments.

"The *Glasgow Herald* of 9th April draws attention to a shipment by the s.s. *Nestor* of 12 Clydesdales, comprising 4 stallions and 8 mares, purchased by Mr. John B. Hamilton, of Maitland, South Australia. Reading the particulars of the consignment, it is evident that these horses have been selected from the best studs in Scotland, and should be a great acquisition to South Australia's horse breeding stock."

VETERINARY INQUIRIES.

[Replies supplied by the veterinary officers of the Stock and Brands Department.]

Worms in Foals.

"Saddleworth" reports foals that appear rough in coat and passing worms.

Reply—If the foals are running in a paddock with older horses or in a paddock where older horses have been, they would pick up the worms' eggs off the ground. Older animals may have quite a large number of worms without showing any symptoms. Worms are not infectious, but their eggs are passed out on to the ground and other horses grazing in the same paddock will become infected. To clear out the worms give ½ pint of raw linseed oil with 1oz. of turpentine in it, after starving for 12 hours; then give 1 tablespoon of Fowler's solution sprinkled on the food once daily for 14 days. Give chaff, crushed oats and bran. A little linseed meal would help considerably.

Pigs Stiff in Joints.

"Wasleys" reports young pigs very stiff in joints and almost unable to walk.

Reply—Supply the sow with plenty of greenfeed such as lucerne if possible. The trouble is probably due to a deficiency of vitamins which are found in greenstuffs. Give a mineral mixture of 10 parts of bone meal and charcoal and 1 part of salt.

Skin Disease in the Pig.

"Hon Secretary, Frayville Agricultural Bureau," reports mortality in a litter of young pigs, the skin of which goes black.

Reply—The information is not sufficient upon which to base a diagnosis, but suggests that the piglets may be affected with impetigo, a skin disease due to inoculation by bacteria. This disease may be associated with the presence of pig lice, but insanitary conditions may play a big part. Only young pigs (whose skin is soft and tender) contract the disease. Treatment indicated is to wash affected piglets in a solution of creolin (4 to 8 tablespoons to 5 pints of warm water) or dress with:—Kerosene, 4 tablespoons; raw linseed oil, 1 pint; shake well before use. Sump oil is sometimes used instead of raw linseed oil, but in hot weather it is apt to scald the pigs. Pigs should be kept in clean surroundings where they can obtain sufficient exercise in the fresh air. If lice are present, dress the pigs with the kerosene and oil dressing.

Stinkwort Poisoning of Sheep.

"Currency Creek" reports death of sheep running in a paddock in which Stinkwort is growing.

Reply—If a paddock of Stinkwort is to be grazed, the sheep should never be turned in on to it in hungry condition, or while it is wet with morning dew or showers of rain, more particularly when the Stinkwort is in the flowering stage of growth. Supplementary feeding should also be given either by hand-feeding or by alternative grazing on other grass pasture or stubble paddock.

PROFESSOR A. J. PERKINS RETIRES FROM THE DEPARTMENT OF AGRICULTURE.

FORTY-FOUR YEARS OF OUTSTANDINGLY USEFUL WORK.

PROFESSOR ARTHUR J PERKINS,
who retired from the Public Service of South Australia on 11th May, 1936.

"On the occasion of your retirement from the Public Service of South Australia, we desire to express to you our affectionate regards and esteem.

"You have rendered eminent service to the State during the past forty-four years, as Professor of Viticulture, Principal of the Roseworthy College, and finally as Director of Agriculture.

"Your zealous and untiring efforts for the improvement of agricultural practice in South Australia, and your substantial original contributions to agricultural science are widely appreciated. The rapid advancement of agriculture in the State during your period of office as Director of Agriculture is largely due to the influence of your wide knowledge, experience, and mature judgment in rural problems.

"We earnestly hope that you may long be spared to enjoy the leisure which you have so richly earned, and to witness the fruition of your work in the cause of agriculture."

[Such was the text of an illuminated address presented to Professor Perkins (Director of Agriculture), who retired from the Public Service on 11th May. The address, together with a typewriter, desk, and chair, was formally handed to him by the Minister of Agriculture (Hon. A. P. Blesing, M.L.C.), at a largely attended social given in his honour on 15th May by officers of the Department of Agriculture, representatives of the Waite Agricultural Research Institute, members of the Advisory Board of Agriculture and the Governing Council of Roseworthy Agricultural College, and other departments and organisations with which Professor Perkins was associated for many years.]

The retirement of Professor Perkins, on attaining the age-limit set for public servants, was a decided loss to the rural interests of the country, and a cause for the regret of his colleagues in the Department. For the past 44 years he has held prominent positions in the Public Service of the State, and few men have been so fortunate as to be able to inaugurate and carry to useful lengths so much work as he has achieved. The possession of an absolutely fearless nature, nothing diverted him from a course once set, and as a consequence most of his work has, and is, bearing fruit of value to the producers of the country. He remained at all times the friend and kindly adviser of all who approached him on any matter of a private or public nature.

Professor Perkins arrived in South Australia from Tunis in 1892, after having been educated in England and France, to take up the position of Professor of Viticulture and Oenology; and he retained this position until 1901, when he was appointed to the head of the Department under the title of Secretary of Agriculture. In 1904 he was made Principal of Roseworthy Agricultural College, and remained in charge of that institution for 10 years, although one of these was spent in a tour of Europe. During 1910 he investigated the agriculture of several European countries, and reported to the Government in a most entertaining book, the impressions gained during that tour. In 1914 he was appointed Director of Agriculture, which position he has filled with conspicuous ability from that date until the time of retirement.

An extremely versatile agriculturist, Professor Perkins has proved highly successful as an educationist, a very capable administrator, an agricultural economist of some note, and perhaps was even more outstanding as an agricultural experimentalist.

At the time of his arrival in the country in 1892, little was known of the correct method of pruning vines for the natural conditions which obtained, and many unsound wines were being placed on the market, but it was not long before he had taught vine-growers and wine-makers how to correct these serious deficiencies. His work with the production of spirits from raisins showed commercial interests the possibilities in that direction, and had something to do with the installation of distilleries on the River Murray Settlements. Altogether, he played a considerable part towards the prosperous position in which the important wine-making industry finds itself to-day.

As an agricultural experimentalist, Professor Perkins has been particularly prominent, and his wonderful foresight led him to undertake experimental work which was of the greatest importance at the time, and the extent of which was really amazing. He was the first in Australia to arrange permanent experimental plots on the lines followed for years at Rothamsted, the first to conduct actual digestibility tests, when he used horses on cereal hays, the first to undertake the improvement of cereals by systematic selection, and the first to work out the correct depth to sow agricultural seeds in our climate. He was early in the field with the cross-fertilisation of cereals, inaugurated the lamb-breeding experiments at Roseworthy, which eventually became so noted, and conducted experiments in manuring, liming, cultivation, rotation, feeding-off of crops, and in many other directions.

Professor Perkins has always been able to see the great possibilities for the production of pork for export, and has been a stalwart in support of the growing of olives. He also foresaw the trouble that was coming from the too rapid adoption of the tractor as the means of draught for farm implements, and consistently warned producers to go slowly, when practically all other advisers were luke-warm on the matter or actively advising its use. Of recent years, agricultural economics have occupied much of his time, and as a result he has contributed several very useful articles on the subject.

A prodigious writer throughout his official career, all experimental work undertaken by him has been fully and clearly reported upon, and besides these reports an enormous collection of articles dealing with all phases of South Australian agriculture has come from his pen.

A consistent supporter of the primary producer against all opposing interests, and a just head of the Department of Agriculture, Professor Perkins will be

APPOINTMENT OF MR. W. J. SPAFFORD AS DIRECTOR OF AGRICULTURE.

There has probably never been an appointment that was more confidently anticipated by primary producers than that of Mr. W. J. Spafford, R.D.A., as Director of Agriculture. Mr. Spafford has been well known throughout the State as Deputy Director of Agriculture and under his new official title he will be sincerely congratulated and welcomed by all. As a much travelled officer he has obtained, by observation and by personal acquaintanceship with farmers, a thoroughly intimate knowledge of the farming practices as applied to South Australian agriculture in the widest scope of its meaning—not confined to the growing of crops, but including the management of pastures, the raising of livestock, dairying, horticulture, viticulture and other phases of production suited to the State. Such attributes of versatility are essential for the successful control of a department of agriculture and for guiding the development of agricultural pursuits. Primary producers—no matter the sphere in which they may be engaged—should be assured, therefore, that under Mr. Spafford's directorship, there will be a continuance of that sound counsel which has characterized the work of the Department in the past.

MR. W. J. SPAFFORD, R.D.A.,
who was recently appointed Director of Agriculture

Mr. Spafford's first association with the Department of Agriculture was at Roseworthy Agricultural College in 1905 when, two years subsequent to gaining the diploma of that institution, he joined its staff as Assistant Experimentalist and later was appointed to the teaching staff. It was at Roseworthy that he bred varieties of wheats which are of prominence to-day and which have had some influence in increasing the wheat yields of the State. Ford, Sultan and Felix are three of his important wheats. Caliph, Daphne, and Queen Fan are among others bred by him and he had a hand in the selection of King's White from King's Early, Late Gluyas from Gluyas, as well as the purification of Gluyas from other types.

In July, 1914, with Professor Perkins who was then appointed Director of Agriculture, he was transferred to Adelaide and in 1927 he became Deputy Director. In that capacity he visited every part of the agricultural areas of South Australia and has kept in personal touch with producers in their own districts. Accordingly, he has acquired a fund of information on farming practices wherever crops of any kind are grown. As a lecturer, Mr. Spafford has gained a popularity well deserved because of a natural gift of imparting information in every day language on a wide range of subjects. He has been a most regular attendant at conferences where his addresses and his replies to questions have been attractive features of such gatherings. Many articles have been written by him for the pages of this Journal. With the full confidence of the farming community these works are eagerly sought and are regarded as text books on their particular subjects. Commissioned to inquire into the agriculture of countries in the same climatic zone as Australia, Mr. Spafford visited New Zealand, South America, and South Africa in 1934-35 and his report on this visit is well known to our readers. The large number of requests for addresses on this tour testify, not only to the value placed on the report, but to his popularity as a lecturer. Mr. Spafford has served on important Commissions and Committees, such as, among others, the Rural Settlement Commission, the Agricultural Settlement Committee, the Committee appointed to inquire into the effect of legislation for controlling butter and cheese, the Employment Promotion Council (he is the chairman of the Land Settlement Committee of that body) and for a while in 1932 he was Acting Principal of Roseworthy Agricultural College. As Director of Agriculture, he will take a seat on the Advisory Board of Agriculture and on the Governing Council of Roseworthy College.

FARM OUTBUILDINGS.

The above was the subject of a paper read by Mr. A. O. Steinborner at a meeting of the Brownlow Branch on April 8th. He stated that the proper arrangement of the outbuildings was just as important as any farm improvements. The stable should be to the south of the house, with the front facing north or north east, or away from the house. Much expenses in the erection of walls could be saved by building the cocky-chaff shed on one side of the stable, with the engine room and chaff shed on the other. The appearance also was improved by grouping the buildings. Feed was always handy, none being wasted as it often was when carried from one shed to another in windy weather. A stable with stone walls and a straw roof would be warmer in winter and cooler in summer. A wood and iron roof, however, was the most trouble-free and lasting. Separate stalls should be made for each two horses, with an extra stall to accommodate any increase in the team. The cow-shed, pig-sty and fowl house could be grouped together in order to save expense as well as time taken in walking when feeding, as all the stock were usually fed at the same time. The combined building should face east with the back towards the house, thus giving good shelter to the stock and a better appearance to the homestead. The wheat barn and store room containing feed for the fowls and pigs should be to the north side of the house and also under the one roof. The building should be of stone with an iron roof and cement floors. If possible the floors should be about two feet above ground level to facilitate loading and unloading. The implement shed, motor shed, blacksmith and work shop should be close together, and should be of wood and iron contruction to minimize the risk of fire. All outbuildings should be at least 1½ chains distant from the house to prevent dust and dirt reaching the house.

OUR WHEAT GROWING AREAS—PROFITABLE AND UNPROFITABLE.

[By Arthur J. Perkins, Director of Agriculture.]

1. INTRODUCTORY.

It was well known that the State of South Australia had been built upon foundations of Wool and Wheat: preponderatingly Wool in the earlier years of settlement, but eventually Wheat to a greater extent than Wool: so much so that it led subsequently to the complete absorption of the majority of settlers in Wheat growing, and to the neglect of other forms of rural activity. This peculiar phenomenon won for us the early derisive nickname ot the "farinaceous State," and what was worse, as we know to-day to our cost, it led to the settlement of Wheat Farmers in districts in which neither soil nor climatic conditions were suited to Wheat growing, with that cereal overwhelmingly the major farm crop.

In fairness to all concerned it should not, however, be overlooked that practically all land thrown open for closer settlement during the past 30 years has been almost exclusively Mallee land, and that apart from the surveying of farm blocks and roadways by Government officials, the heavy task of clearing mallee scrub of varying densities, and subsequently bringing the cleared land into profit—if such were possible—had been left to settlers whose meagre resources have rarely been equal to the task In such circumstances it can be asserted with confidence that without the assistance of Wheat from the earliest years of settlement, the early reclamation of vast areas of economically useless scrub land would to all intents and purposes have been impossible.

But because with the assistance of Wheat, 10 to 20 years of unremitting toil might eventually have led to the satisfactory reclamation of Mallee scrub, it does not follow that any of the crops grown during this preliminary period would have been profit bearing, *i.e.*, would have left a margin of profit to the grower after due satisfaction of the claims of interest on capital invested, of adequate provision for the replacement of rapidly wasting assets, of costs of necessary purchases of farming material, and labour, &c. And yet this work has usually been undertaken by men of very limited means. We cannot expect much from four or five wheat crops grown successively on the same area of land, nor even from later attempts of Wheat alternating with Bare Fallow on light Mallee lands. Subsequently, a crop of Oats was slipped in between the Wheat Crop and the year of Bare Fallow: and later again, as a concession to the clamour for better farming methods, one year's grazing of natural weed growth has at times succeeded the Oat Crop. The latter practice usually meant that the land would carry a wheat crop in every fourth year, a practice which, whilst satisfactory for good quality mallee land, was not suited to much of the light sandy land of low rainfall districts, from which successful crops cannot be expected more frequently than every seven to 10 years.

2. SUGGESTED REMEDIES.

But what is to be done with such land in intervening years of decennial Wheat crops? And how was the farmer to recoup himself for his considerably reduced wheat areas? As to the last point it can be stated that under the changes contemplated, mean wheat yields per acre would be considerably higher than those registered for these areas during the past 20 years: and as to the first point, in intervening years the land would be grazed by livestock, preferably sheep, besides carrying forage crops for supplementing the deficiencies of natural grazing.

From this it will be noted that I am not suggesting that these farms be converted into miniature station properties: very far from it. The management and handling of livestock on relatively small areas must differ radically from the methods of vast station properties, on which the requirements of livestock were met from the natural growth of grass and edible bush; and when the latter failed, the livestock died of starvation or was shifted to some other property. I am of the opinion that yearly grazing crops, such as Oats, will have to be sown: that forage crops will have to be cut and stacked, as hay or ensilage; and that grain such as Oats or Barley will have to be set aside in anticipation of periods of drought.

Success in animal husbandry of this kind will take years of apprenticeship, during the course of which the average farm will have to be changed to meet the requirements of livestock; smaller paddocks, better fences, adequate provision for water, natural or artificial shelter, &c.: all will have to be met. Hence, if the evil of unsatisfactory Wheat areas is to be given the solution I have suggested, it must be clear that the position could not be rushed, otherwise the cure would probably be worse than the evil. The conversion of these derelict wheat farms into Livestock Farms must therefore be a gradual process, and under adequate technical supervision. It remains to be said that not all of these farms would prove suitable for this purpose, chiefly because of inadequate areas. When such was the case, it would be necessary to group farms together, so as to provide an area sufficient to carry adequately not less than 600 ewes. From such a flock and reduced wheat area, the Labour Income of the Farmer and his family should be very much more satisfactory than from large areas under wheat yielding no more than 3bush. to 5bush. per acre.

3. RECOGNITION OF UNSUITABLE AREAS.

The fact that some of our wheat areas are far from profitable, and because of unfavourable climatic conditions stand little chance of ever becoming profitable, has generally been recognised: no attempt, however, has yet been made to separate apparently unprofitable areas from those that are supposedly profitable· and until this has been acceptably done, it does not seem probable that a definitely satisfactory solution to the problem of unprofitable wheat areas will be reached. It is of course true that, in the final issue decisions will concern individual farms rather than districts: in other words, that competent persons will be called upon to decide as to whether such and such a farm could be expected to grow wheat at a profit within the immediate future: and, if not, to what better purpose could the farm in question be put. On the other hand, since most of these Farms are situated in special districts, in which economic, climatic, and soil conditions are more or less similar, it would simplify the administrative side of the work if such districts were clearly defined: it is the object of this statement to show how, in my opinion, this could best be done.

In the matter of districts I have thought it wise to adopt the lowest territorial unit, of which we have consecutive statistical data, namely, the "*Hundred,*" the mean area of which is according to the Crown Lands Department 75,860 acres, or 118 square miles.

In this connection I have sought to compare the mean wheat performances of each wheat-growing Hundred over a period of 20 years: it seemed to me that if it could be shown that over a period of 20 consecutive years the mean Wheat yield of any hundred had been definitely unsatisfactory. then it was surely time to put the land to some better use. For the purpose I have taken the most modern 20 years' period available from the point of view of statistics, namely, the period closing on 30th June, 1935. Attention should be drawn to the fact that for some of the more recently-settled Hundreds we have not yet got statistical data covering a full period of 20 years: wherever such was the case for any Hundred, the actual number of years of which we have statistical data is shown in the Table at the end of this statement. Obviously, caution should be exercised in passing judgment on Hundreds on the basis of an insufficiently great number of years. It can be added that the particular 20-year period selected—1915-16 to 1934-35 inclusively—is on the whole favourable to unprofitable Hundreds, since it included the finest 12-year period of which we have record, namely, 1915-16 to 1926-27, during the course of which the mean yearly yield of the whole State was 12½bush. per acre and the mean yields of the several Statistical Divisions as follows:—

Mean Annual Yields per acre of Wheat in Statistical Divisions of the State in 12-year period, 1915-16 *to* 1926-27 *inclusively*:—

Divisions.	Mean Annual Yields Per Acre. Bush.
1. Central	14.30
2. Lower North	16.41
3. Upper North	12.83
4. South-East	12.99
5. Western	8.03
6. Murray Mallee	9.06

It will be admitted that the above record was entirely satisfactory: the record of the remaining eight years, on the other hand, was far less so: of these eight seasons, five were definitely unsatisfactory, and the balance no more than mediocre. The annual mean yield of the State which had been 12½bush. per acre in the 12-year period ending in 1926-27 fell to 8.94bush. per acre in the eight-year period ending in 1934-35.

The combination of these two periods, namely, the 20-year period ending in 1934-35, should therefore give us satisfactory standards of comparison, which would represent a reasonable compromise between favourable and unfavourable seasons. During this period the State mean annual yield per acre was 10.70bush., and the mean yields in the various Statistical Divisions as follows:—

Mean Annual Yield per acre of Wheat in Statistical Divisions of the State in 20-year period 1915-16 to 1934-35 *inclusively*:—

Divisions.	Mean Annual Yields Per Acre. Bush.
1. Central	13.88
2. Lower North	15.11
3. Upper North	10.00
4. South-East	14.48
5. Western	6.69
6. Murray Mallee	7.32

The next point is more difficult to settle namely, in the examination of the 20-year mean yields per acre of the various Hundreds: what limiting figure should be adopted in order to distinguish between profitableness and unprofitableness in Wheat growing? At the outset it must be recognised that such "limiting figure" must vary more or less from district to district: in other words on Eyre's Peninsula, for example, Wheat could be grown at a profit on a lower general mean yield per acre than in the South-East or in the Lower North, chiefly because in the latter districts higher land values reflected the fact that higher mean yields were possible than on the Peninsula, and the farmer who was unable to make good in these districts under average conditions must blame his own farming methods rather than the seasons or the land. Nevertheless, for the purposes of the present inquiry it does not seem necessary to stress the differences between district and district, in the matter of profitable or unprofitable wheat mean yields: in the main because the doubtful Wheat Hundreds are to be found chiefly in the two Mallee Statistical Divisions, namely, the Western and Murray Mallee Divisions, and to a less degree in the Upper North. It is fairly certain, too, that owing to similarity in environment, mean yields that would be considered unprofitable in one of these districts would be considered equally unprofitable in the others.

With a view to obviating possible future misconceptions, it is perhaps necessary to stress here that references in this statement to unprofitable or uneconomic mean yields of wheat did not in any way concern the mean yields registered for single seasons, but *exclusively mean yields calculated from the returns of 20 successive seasons.* It must be obvious that we cannot condemn a district because of apparently uneconomic yields in certain individual seasons: in such circumstances the profits of favourable seasons were supposed to make good the losses of unfavourable seasons: and apart from cases of land booms or of urgent personal requirements, it is on this basis that land values were more or less intuitively determined.

4. INFLUENCE OF WHEAT PRICES.

Obviously, too, in any settlement of this question the possible influence of mean prices offering for Wheat must also be given due consideration. For 74 years of which we have records the mean price realised for Wheat at outports has been 4s. 7½d. per bushel: or allowing 4d. for Rail freight, which is the mean rate in South Australia, 4s. 3½d. at railway sidings. On the other hand, for the 20-year period with which we are at present concerned, mean prices paid at outports for each season were as follows:—

	Per Bush.			Per Bush.			Per Bush.	
	s.	d.		s.	d.		s.	d.
1915-16	4	9	1922-23	4	11	1929-30	4	4
1916-17	4	9	1923-24	4	8	1930-31	2	3½
1917-18	4	9	1924-25	6	1	1931-32	3	2
1918-19	5	6	1925-26	6	2½	1932-33	2	9¾
1919-20	9	0	1926-27	5	3½	1933-34	2	7½
1920-21	8	0	1927-28	5	5¼	1934-35	3	0½
1921-22	5	0½	1928-29	4	8¾			

The average price of Wheat for these 20 years was 4s. 8d. per bushel at outports, or 4s. 4d. at railway sidings. In discussing the question of unprofitableness of certain Hundreds, we shall have to discard any idea of the recurrence of prices of 8s. to 9s. per bushel that characterised the early years that followed the Great War. I wish I could say the same of the low prices that have characterised the depression from which we are now emerging. The World has learnt that there was no difficulty in producing in one year considerably more wheat than could be consumed in that year, and until such knowledge becomes legendary by fluxion of time its influence should suffice to check the tendencies of momentary difficulties to encourage speculation and undue rise in price: and in the long run this would be of advantage not only to consumers, but to producers as well. It seems to me that for the next few decades we shall be safe in basing Wheat values on prices that should oscillate between 3s. and 5s. per bushel. At the maximum of 5s. I feel that we shall all agree that the crop returns of the average South Australian Farmer (excluding those situated in the unsound areas) and who according to the seasons should average from 12bush. to 20bush. per acre, should be amply remunerative. But what of those whose mean yields varied from 3bush. to 5bush. per acre? From such farms the gross returns per acre would be from 15s. to 25s.; and by no stretch of imagination can I conceive that such returns would suffice to meet inclusive costs of wheat growing, including interest on capital investments, provision for replacement of wasting assets, purchase of essential farming material, the payment of hired labour (if any), and the upkeep of the farmer and his family. And with wheat at 3s. per bushel the position would be proportionately worse. In the circumstances the continued solvency of those wheat growers who are situated in unsound areas cannot be anticipated; and any attempt temporarily to bolster up their financial position would be mistaken kindness unless they agreed to abandon wheat as the major enterprise of their farms.

5. SUGGESTIONS FOR LIMITS OF PROFITABLENESS IN WHEAT GROWING.

After careful consideration of the whole position, I have come to the conclusion that any farm, and any Hundred, in which the mean yield per acre over a period of 20 years or more could be shown to be less than 6bush., should be declared unsuitable for wheat growing and treated accordingly.

At the end of this statement I have prepared a Table in which all the Wheat growing Hundreds have been set out, grouped together in their respective Counties, and the respective Statistical Divisions to which they belong. The information given in Table V. comprises:—

Column 1.—Name of Hundreds, with the exception of County Adelaide in which the names of District Councils have been unavoidably substituted.

Column 2.—The number of seasons to which mean figures in succeeding columns correspond.

Column 3.—Mean yearly areas under Wheat over a period of 20 seasons closing with 1934-35 season inclusively, or such less number of seasons as Column 2 indicates.

Column 4.—Mean yearly total production of Wheat over a period of 20 seasons closing with 1934-35 inclusively, or such less number of seasons as column 2 indicates.

Column 5.—Mean yearly yield per acre of Wheat over a period of 20 seasons closing with 1934-35 season inclusively, or such less number of seasons as Column 2 indicates.

In Table V. all Hundreds in which the mean yields per acre are less than 6bush. names of Hundreds have been printed in heavier type, and all Hundreds in which the mean yields per acre attained 12bush. and over have been printed in lighter type. Data corresponding to those supplied for each Hundred have also been given for the Counties in which the Hundreds were situated.

6. MAP OF WHEAT GROWING HUNDREDS.

A special Map has been prepared by the Lands Department, to whom I desire to express my thanks, to illustrate graphically data set out in Table V.: but as this Map was unavoidably small in size, in order to avoid confusion, the information conveyed upon it has been confined to matters strictly relevant to the subject matter of this statement. The information given may be summarised as follows:—

1. The Map has been divided up into Hundreds (with the exception of County Adelaide which has been divided into District Councils shown in the enlargement). No attempt has been made to show Counties or Statistical Divisions.

2. In the space allotted to each Hundred (or District Council in County Adelaide) the name of the Hundred or District Council is given coupled with a number as follows:—Caldwell: 4.12, which means that during the 20-season period ending in 1934-35, or such less period as is shown in column 2 of Table V., the mean yearly yield per acre of the Hundred of Caldwell, situated in County Hopetoun

and the Western Statistical Division, was 4.12bush. only. Similarly, Bundaleer: 22.23, means that over the same period the mean yearly yield per acre of the Hundred of Bundaleer, situated in County Victoria and the Lower North Statistical Division was 22.23.

3. All Hundreds the mean yearly yields per acre of which during the 20-year period ending in 1934-35 were below 6bush. have been tinted in yellow: all those the mean yearly yields per acre of which over the same period were 12bush. and over have been tinted in blue: Hundreds with intermediate yields have been left in white.

4. "Goyder's Line" has been shown by a thick broken line coloured in bright red.

5. The isohyets, *i.e.*, lines connecting places with the same mean rainfall have been shown by thin continuous lines coloured in bright red. In the present instance these isohyets do not represent total rainfall, but rain falling during the growing period of the wheat crop, *i.e.*, April-November inclusively.

7. SUMMARISED EXAMINATION OF HUNDREDS YIELDING LESS THAN 6 BUSHELS PER ACRE.

A close examination of Table V. would show that out of the 470 Hundreds which have been producing Wheat in the 20-year period under consideration, there were 156 Hundreds in which the mean yearly yields per acre were less than 6bush. These doubtful Hundreds were distributed as follows in the six Statistical Divisions of the State:—

TABLE I.

Summarised data concerning Hundreds with Mean yields of less than 6bush. to the acre in 1915-16 to 1934-35 20-year periods—

Statistical Divisions.	Number of Hundreds.	Mean Yearly Area Under Wheat.	Mean Production.	
			Total.	Per Acre.
	Nos.	Acres.	Bush.	Bush.
Central	9	21,415	97,168	4.54
Lower North	4	3,667	17,716	4.83
Upper North	26	55,396	282,343	5.10
South-East	3	275	1,423	5.17
Western	87	407,925	2,026,439	4.97
Murray Mallee	27	198,804	1,045,462	5.26
The State..	156	687,482	3,470,551	5.05

From the above it will be observed that during the 20-year period ending in 1934-35, the 156 doubtful Hundreds were responsible for a mean yearly total of 687,482 acres of wheat, or nearly one-quarter (23.5 per cent.) of the State mean total for the same period, namely, 2,925,248 acres: whereas for the same period the production of these hundreds was 3,470,551bush., or about one-eighth only of the State's mean production, namely, 31,309,130bush.

The depressing influence of the production of these doubtful Hundreds upon the State's mean yields per acre may be illustrated by the following example: for the 20-year period ending in 1934-35 the State mean yearly yield per acre was 10.70bush. only: if on the other hand we deducted area sown and wheat produced by the doubtful Hundreds from corresponding State figures the State mean yield per acre would rise from 10.70bush. to 12½bush.

8. HUNDREDS YIELDING LESS THAN 5 BUSHELS TO THE ACRE.

It is possible that it may be argued that 5bush. was a better limiting figure between profitable and unprofitable wheat crops than 6bush.: and although I do not admit the truth of any such contention, I submit below in Table II. data corresponding to those included in Table I.

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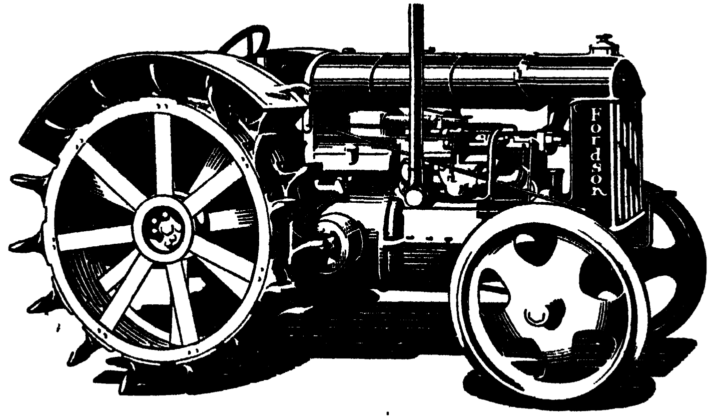

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TABLE II.

Summarised data concerning Hundreds with Mean yields of less than 5bush. to the acre in the 1915-16 to 1934-35 20-year period:—

Statistical Divisions.	Number of Hundreds. Nos.	Mean Yearly Area Under Wheat. Acres.	Mean Production. Total. Bush.	Mean Production. Per Acre. Bush.
Central	8	21,195	95,881	4.52
Lower North	3	1,928	8,864	4.60
Upper North	11	13,604	56,438	4.15
South-East	1	17	66	3.88
Western	47	209,905	945,420	4.50
Murray Mallee	12	61,746	274,893	4.45
The State..	82	308,395	1,381,562	4.48

It will be observed that in the 20-year period ending in 1934-35 there were 82 Hundreds the mean yearly yields per acre of which were less than 5bush.; that the mean yearly area harvested for Wheat in these Hundreds was 308,395 acres, or 10.45 per cent. of the State mean area harvested for Wheat in that period; that the mean production of these Hundreds was 1,381,562bush., or 4.41 per cent. only of the mean total State production.

9. HUNDREDS WITH HIGH MEAN WHEAT PRODUCTION.

We shall now turn to the more gratifying consideration of the Hundreds with relatively high mean yields per acre: data concerning the latter have been summarised in Table III. below:—

TABLE III.

Summarising 1915-16 to 1934-1935 (20 seasons) data concerning Hundreds that averaged 12bush. and over:—

Statistical Divisions.	Number of Hundreds. Nos.	Mean Yearly Area Under Wheat. Acres.	Mean Annual Production. Total. Bush.	Mean Annual Production. Per Acre. Bush.
		12bush. but under 14bush.		
Central	24	99,242	1,288,398	12.98
Lower North	5	108,872	1,424,138	13.08
Upper North	1	14,074	169,099	12.02
South-East	7	1,845	23,817	12.96
Western	2	11,907	149,874	12.59
Murray Mallee	1	36,002	435,872	12.10
The State..	40	271,962	3,491,198	12.83
		14bush. but under 16bush.		
Central	16	119,809	1,854,952	15.48
Lower North	13	241,621	3,588,522	14.85
Upper North	3	45,968	680,734	14.81
South-East	6	8,793	136,841	15.56
Western	2	11,680	170,269	14.58
Murray Mallee	—	—	—	—
The State..	40	427,871	6,431,818	15.03
		16bush. and Over.		
Central	14	164,773	2,886,569	17.52
Lower North	22	284,536	5,131,996	18.04
Upper North	3	30,788	526,023	17.09
South-East	9	19,584	368,301	18.81
Western	—	—	—	—
Murray Mallee	—	—	—	—
The State..	48	499,681	8,912,889	17.84

From the above it will be observed that in the 20-year period ending in 1934-35:—

Forty Hundreds with an aggregate mean yearly area under Wheat of 271,962 **acres, or 9.30 per cent. of the State total mean area, and an aggregate** mean yearly **production of 3,491,198bush., or 11.15** per cent. of the State total mean production, **averaged** 12.83bush. per acre.

Forty Hundreds with an aggregate mean yearly area under Wheat of 427,871 acres, or 14.62 per cent. of the State total mean area, and an aggregate mean yearly production of 6,431,318bush., or 20.54 per cent. of the State total mean production, averaged 15.03bush. per acre.

Forty-eight Hundreds with an aggregate mean yearly area under Wheat of 499,681 acres, or 17.08 per cent. of the State total mean area, and an aggregate mean yearly production of 8,912,889bush., or 28.47 per cent. of the State total mean production, averaged 17.84bush. per acre.

In contrast with the disappointing yields with which we have hitherto dealt, those set out in Table III. are much to the credit of the farmers responsible for them.

Finally, I have indicated in Table IV. in order of merit all Hundreds which averaged 18bush. or over in the 1915-16 to 1934-35 period.

TABLE IV.—*Showing data concerning all Hundreds that yielded* 18*bush. or over per acre in the* 1915-16 *to* 1934-35 *period.*

Order.	Name of Hundred.	Name of County.	Mean Area per Annum.	Mean Production per Annum.	
				Total.	Per Acre.
			Acres.	Bushels.	Bushels.
1	Gambier	Grey	147	3,709	25·19
2	Mount Muirhead	Grey	1,992	44,650	22·41
3	Bundaleer	Victoria	13,858	308,128	22·23
4	Darling	Frome	582	12,697	21·83
5	Hindmarsh	Grey	775	15,880	20·49
6	Blanche	Grey	215	4,237	19·74
7	Maitland	Fergusson	21,502	421,109	19·58
8	Milne	Stanley	12,111	232,826	19·22
9	Anne	Victoria	5,417	103,694	19·14
10	Stanley	Stanley	18,497	352,967	19·08
11	Saddleworth	Light	9,808	186,640	19·03
12	Andrews	Stanley	13,001	246,486	18·96
	Hart	Stanley	14,901	282,550	18·96
14	Wongyarra	Frome	7,781	147,232	18·92
15	Narridy	Victoria	11,251	212,304	18·87
16	Tatiara	Buckingham	12,779	240,046	18·79
17	Curramulka	Fergusson	12,119	237,449	18·76
18	Yackamoorundie	Stanley	9,481	176,540	18·62
19	Hanson	Stanley	13,958	258,985	18·55
20	Alma	Gawler	17,392	317,831	18·27
21	Reynolds	Victoria	12,409	224,733	18·11
22	Yangya	Victoria	13,183	238,254	18·07
	22 Hundreds		223,159	4,268,947	19·13

The area covered by the Wheat crops of these 22 Hundreds corresponded to 7.63 per cent. of the total State area only; whereas the production of the same Hundreds corresponded to 13.63 per cent. of the Total State Production.

10. "GOYDER'S LINE."

"Goyder's Line" has been shown as a thick broken bright red line on the Map that accompanies this statement. This line was laid down in 1865, that is to say, 29 years after the foundation of the Colony, by G. W. Goyder, who at the time and many years subsequently held the position of Surveyor-General. His object had been to set down a line of demarcation between pastoral areas that had suffered intensely from the effects of two consecutive years of drought and those that had not so suffered. The special requirements of cultivated crops were certainly not in his mind, as at that time cultivation does not appear to have extended much north of Clare. Later on, however, a tendency arose to make use of this line for the purpose of distinguishing between land that was suitable for farming purposes and land that was not suitable. Needless to add that only land to the South of the line was considered suitable for farming. Later on, however, the gradual absorption into cultivation of land available South of the line, led to farming excursions outside the line, and particularly so in recent times. Hence, it will be of interest to ascertain how those Hundreds that are situated outside Goyder's line have fared during the 20-year period which ended in 1934-35. But before examining available facts in the matter, I propose giving a brief description of the line for the benefit of those who are not familiar with it.

Goyder's Line makes an easterly start from the Victorian border about 4 miles south of Peebinga: it proceeds in a north-westerly direction, cutting off a narrow triangle of the southern portion of County Albert, about four-fifths of the area of which lie outside the line. The latter enters County Eyre at Swan Reach, and proceeds steeply in a north-north-westerly direction, leaving one-half of County Eyre outside the line. It subsequently enters County Burra a mile or so from Robertstown, taking an almost northerly direction, and leaving three-quarters of the County outside the line. It then cuts across the South-west corner of County Kimberley, and proceeds in a north-westerly direction by way of Yatina to the centre of County Dalhousie. From this point it dips steeply in a south-south-westerly direction into County Frome to the level of Murraytown, but about 19 miles east of the town: the line then rises again on an equally steep grade but in a north-westerly direction, skirting the Northern foothills of Mount Remarkable, and falling steeply in a regular south-easterly curve to the level of Crystal Brook, and thence in a south-westerly direction, until it reaches the sea at Port Hughes.

Across the Gulf, on Eyre's Peninsula, Goyder's Line starts from the seacoast at a point four miles west of Point Gibbon: thence it proceeds north-westerly, without appreciable change of direction, coming to an end in the Hundred of Hague, about eight miles North-west of Nunjikompita. In this regular North-westerly progress the line passes successively through the following Hundreds:—Boothby, Mann, Yadnarie, Smeaton, Darke, Cootra, Mamblin, Wannamanna, Wudinna, Pygery, Pinbong, Minnipa, Pildappa, Condada, Kaldoonera, Yantanabie, Wallala, Petina, Nannyah, and Hague. All land west of this point has been deemed to be outside the line.

Let us now consider the extent to which Wheat growing outside Goyder's Line can be considered to have succeeded.

MURRAY MALLEE DIVISION.

Starting from the Victorian border, Goyder's Line divides the Murray Mallee Statistical Division into two approximately equal parts: to the north Counties Young, Hamley, Alfred, approximately seven-eighths of County Albert and one-sixteenth of County Chandos are outside the line. The balance of the area falls within the line.

In Counties Hamley and Young, north of the River Murray, the highest mean yield per acre secured during the 20-year period under consideration by any Hundred was 5.55bush. per acre (Hundred of Parcoola): and we can safely claim that neither county is suited to the growing of Wheat as a major farm crop.

In County Alfred, which lies south of the River, but is also wholly outside Goyder's line, one Hundred only, namely, Hundred of Allen, did not reach 6bush. per acre in the 20-year period ending in 1934-35. It is apparent therefore that there is no reason for discountenancing Wheat farming in County Alfred.

In County Alfred, which lies south of the River, but is also wholly outside partly without Goyder's Line, there were eight Hundreds out of 13 which averaged less than 6bush. per acre in the 20-year period under consideration, namely: Bakara (5.83bush.), Cadell (5.04bush.), Holder (4.76bush.), Mantung (5.40bush.), Moorook (5.45bush.), Paisley (5.75bush.), and Waikerie (4.54bush.), all of which lie outside the line and do not appear to have justified themselves as Wheat growing hundreds. Of the Hundreds lying outside the line Murbko alone had a mean yield of 6bush. or over, namely, 6.52bush. per acre.

On the other hand in County Chandos, the four Northern Hundreds which are partly outside the line averaged less than 6bush. per acre in the 20-year period, namely, Auld (3.39bush.), Billiatt (3.41bush.), Kingsford (4.49bush.), and Peebinga (4.50bush.). They cannot therefore be said to have justified themselves as Wheat-growing Hundreds, as yet: I say as yet, as none of them has completed a full 20-year test: the records varying from nine years in Billiatt to 16 years in Peebinga.

Although County Buccleuch was wholly within Goyder's Line it included six Hundreds out of 16 the mean yields of which did not reach 6bush. in the 20-year period, namely, Kirkpatrick (5.16bush.), Livingstone (5.34bush.), Molineux (5.95bush.), McPherson (5.99bush.), Sherlock (5.71bush.), and Strawbridge (5.56bush.). It is probable that the failure of these Hundreds is attributable more to soil than to climatic condition: and the position may possibly be improved in the course of time: it is generally possible to improve faulty soil conditions, but rarely those that relate to climate.

In County Russell, which was wholly within the line, the Hundred of Ettrick alone fell below the standard, namely, 5.31bush.: this was due mainly to unfavourable soil conditions.

CENTRAL DIVISION.

Goyder's line enters the Central Division at Swan Reach, and proceeds diagonally across County Eyre to Robertstown. This County includes eight Hundreds out of 13 that do not come up to the requisite standard, namely, Anna (4.90bush.), Beatty (4.55bush.), Bower (4.36bush), Brownlow (4.48bush), Eba (3.63bush.), Fisher (5.86bush.), Hay (3.41bush.), and Skurray (3.28bush.), all of which are wholly or partly outside the line. None can be said to have justified attempts to farm with Wheat as the major crop.

LOWER NORTH DIVISION.

From County Eyre the line enters the Lower North along the Western quarter of County Burra: this County includes three Hundreds that failed to reach the requisite standard, all of which were situated outside the line, namely, Bundey (4.69bush.), Lindley (4.17bush.), and Maude (4.07bush.). In none of these three Hundreds is continued Wheat-growing justified.

From County Burra Goyder's line cuts across the South-western corner of County Kimberley on its way to the Upper North Division. County Kimberley contains one out of four Hundreds that was below minimum requirements, namely, Parnaroo (5.09bush.). The remaining Hundreds although all outside the line have mean yields varying from 6.03bush. to 10.10bush.

Apart from the above the coastal areas of Counties Victoria and Daly are also to a shallow extent outside Goyder's line: but in every instance individual mean yields of the Hundreds of these two fine Counties are considerably above the mean requirements of successful Wheat-growing: the lowest mean yield in County Daly was 11.20bush. (Mundoora) and in County Victoria 8.32bush. (Pirie).

UPPER NORTH STATISTICAL DIVISION.

In the Upper North Division there are 10 Counties, eight of which are wholly outside Goyder's line and the remaining two of which—Counties Frome and Dalhousie—have three-quarters of their areas outside the line. In seven out of these 10 Counties Wheat is being grown more or less extensively.

In County Frome, Hundreds of Coonato (3.79bush.), Davenport (3.55bush.), and Winninowie (3.94bush.) should be definitely discarded as Wheat growing areas: and the same can be said of Hundreds of Erskine (5.24bush.), Oladdie (5.21bush.), Walloway (5.09bush.), and Yalpara (1.45bush.) in County Dalhousie.

In County Herbert, apart from Coglin (6.68bush.), the remaining five Hundreds should be discarded as Wheat growing propositions. In County Newcastle the same can be said of Hundreds of Coolcunda (5.32bush.), Kanyacka (4.92bush.), Moockra (5.66bush.), and Palmer (5.48bush.). And the same, again, of all the Hundreds of County Granville with the exception of Hundreds of Wirreanda (6.83bush.), and Yednalue (6.98bush.): and of all the Hundreds of Counties of Blachford and Hanson, with the exception of Wonoka (6.19bush.) in Blachford, and Moralana (7.30bush.) in Hanson.

SOUTH-EAST STATISTICAL DIVISION.

The whole of this Division is well within Goyder's line, and the low yields in some of the Hundreds of this Division are attributable in the main to soil poverty or defective drainage, both of which as a rule can in time be remedied. Attention is drawn to apparently unsuitable Hundreds, namely, County Buckingham: Archibald (5.25bush.), and County Robe: Ross (5.27bush.), Waterhouse (3.82bush.).

WESTERN STATISTICAL DIVISION.

It is in this Division that doubtful Hundreds are most frequent: out of 140 Hundreds in which Wheat was grown more or less extensively, 74, or more than one-half, have mean yields per acre very appreciably below minimum in requirements: it must not be forgotten, however, that in many Hundreds the process of reclamation has not yet gone sufficiently far to permit of definite judgment in the matter.

Out of the 13 Counties in this Division three are wholly within Goyder's Line, namely, Counties Flinders, Musgrave, and Robinson: Counties Jervois and Le Hunte are one-half within and one-half without the line, and County Dufferin one-third within and the balance without. The remaining seven Counties are outside the line.

In the three Western Counties—Hopetoun, Kintore, and Way—there are 20-year records for each Hundred, with the exception of Sturdee (18 years): in the circumstances and in view of the fact that mean yields of all Hundreds in these Counties were below minimum requirements with the exception of those of Miller (6.33bush.) in County Hopetoun, and of Catt (6.07bush.), and Guthrie (6.19bush.) in County Way, I am of the opinion that the practice of farming these hundreds on the basis of Wheat as a major crop should be abandoned.

The same can be said of all the Hundreds in County Dufferin with the exception of Petina (7.03bush.). It should be added, however, that Koolgera (16 years), Nannyah (11 years), and Pureba (11 years) have not completed the full cycle of 20 years, and that due weight should certainly be given to this fact.

In County Robinson, which with the exception of its extreme north-eastern corner is within Goyder's line, there were nine out of 22 Hundreds that were below minimum requirements. Of these five have completed the 20-year cycle, namely, Cungena (5.53bush.), Finlayson (5.54bush.), Ripon (5.15bush.), Tarlton (5.72bush.), and Travers (5.19bush.), and should probably be withdrawn from the list of Wheat-growing Hundreds. The balance have been farmed for shorter periods, namely, Moorkatabie (eight years), Carina (16 years), Chandada (16 years), and Karcultaby (18 years), and should probably be kept under observation.

One Hundred only has been proclaimed in County Bosanquet, namely, Pildappa, which over a period of eight years has yielded 5.53bush. per acre: its future progress should be watched.

Approximately one-half of County Le Hunte is situated outside Goyder's Line. Nine out of 14 Hundreds in this County had mean yields below minimum requirements: of these one only completed the 20-year cycle, namely, Wannamana (5.53bush.); Balabie (5.33bush.) has records of 19 seasons: Kappacoola (5.13bush.) and Warramboo (5.21bush.) of 18: Mamblin (3.96bush.) of 17: Pinbong (4.45bush.) of 10: Pordia (5.02bush.) of seven: Cootra (4.62bush.) and Koongawa (5.57bush.) of six. Hence I am inclined to suspend judgment as to the future possibilities of this County.

County Buxton, which is wholly outside Goyder's Line, has three Hundreds only in which mean yields have been satisfactory, namely, Cortlinye (6.22bush.), Kelly (8.06bush.), and Solomon (6.76bush.). The nine remaining Hundreds have mean yields much below minimum requirements. It remains to be stated that in no one case has any of these doubtful Hundreds completed the 20-year cycle: and the only one that has approached it is the Hundred of Moseley (4.06bush.) with 19 years to its credit, and which can probably be definitely recognised as unsuitable for Wheat growing. The records of the other Hundreds vary from seven to 11 seasons, and whilst it is highly probable that most of them will eventually be found to be unsuitable for Wheat growing as a major farming operation, I hesitate to express a definite opinion on a period which had been characterised by an exceptionally large majority of unsatisfactory seasons.

Approximately one-half of County Jervois lies outside Goyder's Line, and 14 out of 31 Hundreds in this County have unsatisfactory mean Wheat yields. It should be pointed out, however, that seven Hundreds that have yields above 6bush. are situated outside Goyder's Line: namely, Campoona (7.58bush), Hawker (8.19bush.), Jamieson (10.11bush.), Mangalo (8.21bush.), Mann (9.26bush.), Miltalie (7.55bush.), and Pascoe (7.88bush.). Of the doubtful Hundreds 10 have a record of 20 seasons, and should therefore be discarded, while four have records varying from three to 14 seasons, and should be carefully watched.

Counties York and Manchester are both definitely outside Goyder's Line: although with the exception of Hundreds of Ash (20 years) and Randell (18 years) none of these Hundreds has been carrying wheat for any considerable time, one can, I think, consider them to be unsuited to Wheat growing from the viewpoint of the persent statement.

In County Musgrave there are four Hundreds out of 14 that are below minimum requirements, and in Flinders three out of 15; both Counties are well within Goyder's Line, and in both rainfall conditions are usually satisfactory. In the circumstances I see no reason why special steps should be taken to discourage Wheat-growing in the apparently doubtful Hundreds.

11. APRIL-NOVEMBER ISOHYETS.

These Isohyets which are coloured bright red indicate the limits of mean April-November rain throughout the State: the lines have been shown at intervals of 3in. of mean rain.

It will be noted, in the first place that there are very few Hundreds with a mean Wheat yield of 6bush. or over outside the 9in. April-November Isohyet. The exceptions are Murtho (6.36bush.), Paringa (6.19bush.), Gordon (8.57bush.), Bookpurnong (7.56bush.), and Pyap (7.33bush) in County Alfred: Coglin (6.68bush.) in County Herbert: Wirreanda (6.83bush.) and Yednalue (6.98bush.)

in County Granville: and Petina (7.01bush.) in County Dufferin. On the other hand there are many Hundreds within the April-November 9in. isohyet, the mean yields of which were below 6bush. *We are entitled to assume therefore that any district with a mean April-November rainfall below 9in. was open to suspicion from the standpoint of Wheat-growing.*

On the other hand the most consistent satisfactory Wheat returns seem to have been registered for those Hundreds in which the mean April-November rainfall varied from 15in. to 18in.

12. CONCLUDING REMARKS.

The fact that this Report has been prepared and written in the busy closing days of my occupancy of the office of Director of Agriculture must be my excuse for its roughness and unavoidable imperfections. I have endeavoured to set up a standard which should enable us to distinguish between profitable and unprofitable Wheat-growing Hundreds, whenever Wheat was made the dominant factor on the farm. In this connection, I have suggested a mean yield of not less than 6bush. to the acre over a period of 20 successive seasons. And for the purpose I have adopted in this Report the most recent 20-year period of which we had adequate statistical data, namely, the 20-year period closing in 1934-35 inclusively. These mean yields of all the Wheat-growing Hundreds of the State coupled with other relevant data have been shown in detail in Table V. at the end of this Report: the mean yields have also been shown on a Map of the Hundreds which accompanies this Report.

If such a standard were adopted or any other one, the next step would concern its application in practice. It should be made clear that in the great majority of cases the landholder himself was not to blame for the low yields of his Wheat fields. For the most part these unsatisfactory holdings were situated in areas comparatively recently thrown open to occupation, and the landowners have given years of toil and all the capital they could command to the reclamation of areas which have eventually been found to be unsuitable for wheat-growing. In the circumstances there would seem to be some moral obligation upon the community to re-establish these men who have spent so many years of their life in the national task of endeavouring to reclaim the wilderness. But assistance towards such an end which took the form of monetary bonuses to be spent in continued attempts to grow wheat at a loss was surely the worst possible form of assistance that could possibly be given, from the standpoint of both the State and the settler: in reality it was no assistance at all. If assistance were to be given—and in my opinion it must be given—it should be towards assisting occupants of unprofitable wheat farms to convert their holdings into livestock propositions upon which Wheat would occupy only a very secondary position. I have not in view so many miniature station properties, which could not possibly succeed, but farms upon which sheep husbandry would be practised on relatively small areas: and with the latter should be associated a few cows wherever a reasonable outlet for cream existed. Crops would still have to be raised, but not for sale, but for consumption by livestock. I have suggested a flock of 600 Ewes: and I realise that some of the properties in question were not sufficiently large for the purpose. This would imply the necessity of merging two or more farms into one, and the transference of some families to other districts. Some such scheme should be put in hand, but to no greater extent than was absolutely necessary.

I have had many statements and reports to prepare during my 44 years of service: and it is some satisfaction to reflect that for the most part they have been written for the benefit of others. It is too much to expect that all should have succeeded: but I trust that some at least will have been helpful to the community. Whether such will be the fate of this my last official Report, I do not know; but I hope that it may be.

TABLE V.—*Showing Mean* 1915-1935 (20 *seasons*) *Statistical data concerning Wheat grown in the several Hundreds of the State.*

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

Note.—In County Adelaide, District Council areas have been unavoidably substituted for Hundreds.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
	Nos.	Acres.	Bushels.	Bushels.
I. CENTRAL DIVISION.				
1. County Adelaide, District Council of—				
Barossa	20	2,723	36,776	13·50
Clarendon	14	40	425	10·58
Echunga	14	32	310	9·57
Kondoparinga	10	60	486	8·17
Marion	20	167	2,125	12·71
Mount Crawford	20	76	724	9·53
Munno Para East	20	1,679	27,147	16·17
Noarlunga	20	808	12,443	15·39
Onkaparinga	20	113	1,517	13·38
Salisbury	20	2,860	41,058	14·36
Springton	18	30	279	9·15
Talunga	15	65	610	9·43
Tea Tree Gully	19	132	1,608	12·16
Willunga	20	1,315	18,080	13·75
Woodville	3	41	388	9·55
Yatala South	13	85	1,136	13·35
County Adelaide	20	10,146	144,722	14·26
2. County Hindmarsh, Hundred of—				
Alexandrina	20	1,593	17,762	11·15
Bremer	20	6,035	74,348	12·32
Encounter Bay	20	22	346	15·78
Goolwa	20	1,025	15,737	15·36
Kondoparinga	20	844	13,031	15·43
Macclesfield	20	167	2,200	13·20
Myponga	20	73	993	13·69
Nangkita	20	1,072	14,319	13·35
Strathalbyn	20	4,538	62,052	13·68
Waitpinga	20	243	2,976	12·23
Yankalilla	20	184	2,629	14·29
County Hindmarsh	20	15,795	206,400	13·07
3. County Sturt, Hundred of—				
Angas	20	13,113	112,094	8·55
Brinkley	20	4,813	42,150	8·76
Finniss	20	13,091	136,201	10·40
Freeling	20	3,081	30,241	9·82
Jutland	20	904	9,579	10·60
Kanmantoo	20	640	8,940	13·98
Mobilong	20	9,155	88,426	9·66
Monarto	20	5,673	77,209	13·61
Ridley	20	8,774	54,632	6·23
Tungkillo	20	3,604	50,208	13·93
County Sturt	20	62,847	609,616	9·70
4. County Eyre, Hundred of—				
Anna	20	4,951	24,485	4·90
Bagot	20	6,116	52,317	8·56
Beatty	20	1,894	8,618	4·55
Bower	20	4,492	19,569	4·36
Brownlow	20	9,073	40,674	4·48
Dutton	20	7,922	81,957	10·35

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
I. Central Division—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Eyre, Hundred of—*continued.*				
Eba	20	368	1,337	3·63
English	20	16,508	178,203	10·80
Fisher	15	220	1,287	5·86
Hay	10	176	598	3·41
Jellicoe	20	5,745	68,991	12·01
Neales	20	14,593	137,730	9·44
Skurray	15	234	770	3·28
County Eyre	20	72,027	614,795	8·54
5. County Light, Hundred of—				
Belvidere	20	10,207	129,778	12·71
Gilbert	20	14,763	261,491	17·71
Julia Creek	20	11,433	183,965	16·09
Kapunda	20	9,506	151,370	15·92
Light	20	9,961	148,644	14·92
Moorooroo	20	4,316	52,255	12·11
Nuriootpa	20	6,128	78,237	12·77
Saddleworth	20	9,808	186,640	19·03
Waterloo	20	13,644	224,434	16·45
County Light	20	90,274	1,425,941	15·80
6. County Carnarvon, Hundred of—				
Cassini	3	16	114	6·96
Dudley	20	253	2,568	10·16
Duncan	5	11	82	7·05
Haines	6	73	547	7·49
McGillivray	20	187	3,032	16·24
Menzies	18	443	5,237	11·81
Seddon	5	7	30	4·05
County Carnarvon	20	867	10,516	12·13
7. County Gawler, Hundred of—				
Alma	20	17,392	317,831	18·27
Balaklava	20	19,351	255,441	13·20
Dalkey	20	19,430	321,271	16·53
Dublin	20	15,162	198,930	13·12
Grace	20	20,013	303,102	15·15
Inkerman	20	12,404	113,347	9·14
Mudla Wirra	20	11,584	191,237	16·51
Port Gawler	20	6,823	82,775	12·14
County Gawler	20	122,160	1,783,927	14·60
8. County Ferguson, Hundred of—				
Carribie	20	716	8,893	12·43
Coonarie	10	125	868	6·97
Cunningham	20	19,598	312,899	15·96
Curramulka	20	12,119	227,349	18·76
Dalrymple	20	6,913	101,752	14·72
Kilkerran	20	18,351	305,507	16·65
Koolywurtie	20	7,846	123,353	15·72
Maitland	20	21,502	421,109	19·58
Melville	20	7,663	110,114	14·37
Minlacowie	20	9,565	157,062	16·42
Moorowie	20	3,577	57,184	15·99
Muloowurtie	20	12,117	193,337	15·96
Para Wurlie	20	3,316	58,494	17·64
Ramsay	20	4,214	58,611	13·79
Wauraltee	20	16,872	267,953	15·88
Warrenben	15	129	744	7·67
County Ferguson	20	144,516	2,398,473	16·60

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
	Nos.	Acres.	Bushels.	Bushels.
II. LOWER NORTH DIVISION.				
1. County Daly, Hundred of—				
Barunga	20	17,794	264,753	14·88
Cameron	20	16,571	229,350	13·84
Clinton	20	18,978	262,301	13·82
Kadina	20	30,409	429,984	14·14
Kulpara	20	18,298	282,019	15·41
Mundoora	20	12,492	139,905	11·20
Ninnes	20	19,563	294,868	15·07
Redhill	20	14,467	215,275	14·88
Tickera	20	30,115	384,109	12·75
Tiparra	20	44,671	746,934	16·72
Wallaroo	20	22,791	289,461	12·70
Wiltunga	20	23,877	336,574	14·10
Wokurna	20	20,417	258,917	12·68
County Daly	20	290,740	4,143,313	14·25
2. County Stanley, Hundred of—				
Andrews	20	13,001	246,486	18·96
Ayers	20	13,417	239,946	17·88
Boucaut	20	21,623	320,281	14·81
Blyth	20	21,027	319,069	15·17
Cleve	20	4,967	87,572	17·63
Everard	20	18,246	204,411	11·20
Goyder	20	17,420	208,688	11·98
Hall	20	19,957	321,681	16·12
Hansen	20	13,958	258,985	18·55
Hart	20	14,901	282,550	18·96
Koolunga	20	17,687	268,283	15·17
Milne	20	12,111	232,826	19·22
Stanley	20	18,497	352,967	19·08
Stow	20	8,642	97,477	11·28
Upper Wakefield	20	7,089	126,229	17·81
Yackamoorundie	20	9,481	176,540	18·62
County Stanley	20	234,706	3,750,596	15·98
3. County Burra, Hundred of—				
Apoinga	20	7,375	127,415	17·28
Baldina	20	937	9,617	10·27
Bright	20	5,175	38,716	7·48
Bundey	20	1,613	7,572	4·69
Hallett	20	6,314	104,788	16·60
Kingston	20	4,250	72,938	17·16
Kooringa	20	4,493	77,644	17·28
Lindley	15	131	546	4·17
Maude	18	184	746	4·07
County Burra	20	30,509	442,574	14·51
4. County Victoria, Hundred of—				
Anne	20	5,417	103,694	19·14
Belalie	20	19,595	351,498	17·94
Booyoolie	20	14,341	237,884	16·59
Bundaleer	20	13,858	308,128	22·23
Caltowie	20	16,194	248,433	15·34
Crystal Brook	20	20,035	299,470	14·95
Howe	20	2,117	32,986	15·58
Napperby	20	15,926	175,404	11·01
Narridy	20	11,251	212,304	18·87
Pirie	20	21,250	100,904	8·32

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
II. Lower North Division—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Victoria, Hundred of—*continued.*				
Reynolds	20	12,409	224,733	18·11
Wandearah	20	14,163	149,961	10·59
Whyte	20	18,530	276,527	14·92
Yangya	20	13,183	238,254	18·07
County Victoria	20	189,395	2,950,116	15·60
5. County Kimberley, Hundred of—				
Gumbowie	20	5,293	42,295	7·99
Parnaroo	20	1,739	8,852	5·09
Terowie	20	2,948	29,720	10·10
Wonna	13	239	1,440	6·03
County Kimberley	20	10,135	81,872	8·08
III. UPPER NORTH DIVISION.				
1. County Frome, Hundred of—				
Appila	20	22,425	366,094	16·33
Baroota	20	11,320	73,189	6·47
Booleroo	20	20,206	301,923	14·94
Coonatto	20	3,823	14,441	3·79
Darling	20	582	12,697	21·83
Davenport	20	974	3,461	3·55
Gregory	20	8,095	92,054	11·37
Pinda	20	11,142	62,383	5·60
Telowie	20	8,975	74,227	8·27
Willowie	20	22,264	209,668	9·42
Willochra	20	14,566	102,852	7·06
Winninowie	20	2,511	9,897	3·94
Wongyarra	20	7,781	147,232	18·92
Woolundunga	20	2,701	17,356	6·43
County Frome	20	137,374	1,487,849	10·84
2. County Dalhousie, Hundred of—				
Black Rock Plain	20	7,563	88,838	11·08
Coomooroo	20	7,987	67,975	8·51
Eurelia	20	5,476	42,962	7·84
Erskine	20	1,419	7,432	5·24
Mannanarie	20	12,207	177,418	14·54
Morgan	20	7,926	61,584	7·77
Oladdie	20	1,104	5,746	5·21
Pekina	20	14,074	169,099	12·02
Tarcowie	20	13,555	201,393	14·86
Walloway	20	1,909	9,714	5·09
Yalpara	14	136	197	1·45
Yongala	20	11,380	120,050	10·55
County Dalhousie	20	84,693	947,412	11·19
3. County Herbert, Hundred of—				
Cavenagh	20	1,001	5,037	5·03
Coglin	20	2,960	19,787	6·68
Nackara	20	656	3,225	4·92
Minburra	6	27	128	4·81
Paratoo	13	131	579	4·42
County Herbert	20	4,709	28,463	6·04
4. County Newcastle, Hundred of—				
Boolcunda	20	3,404	18,094	5·32
Cudla Mudla	17	506	3,377	6·67
Kanyacka	20	3,116	15,320	4·92
Moockra	20	1,439	8,137	5·66
Palmer	20	2,764	15,159	5·48

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
III. Upper North Division—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Newcastle, Hundred of—*continued*.				
Pichi Richi	20	5,160	38,677	7·50
Wyacca	20	1,514	11,236	7·42
Yarrah	20	3,249	25,660	7·90
County Newcastle	20	21,092	135,162	6·41
5. County Granville, Hundred of—				
Bendleby	20	1,171	4,399	3·76
Eurilpa	20	1,152	6,764	5·87
McCulloch	2	160	329	1·99
Uroonda	20	652	3,634	5·57
Wirreanda	20	1,047	7,149	6·83
Yanyarrie	20	1,720	9,494	5·52
Yednalue	17	224	1,559	6·98
County Granville	20	5,957	32,796	5·51
6. County Blachford, Hundred of—				
Bandioota	20	899	4,462	4·96
Wonoka	20	5,655	34,990	6·19
Woolyana	20	801	4,566	5·70
County Blachford	20	7,360	44,168	6·00
7. County Hanson, Hundred of—				
Adams	20	2,173	12,489	5·75
Arkaba	20	9,929	50,835	5·12
Moralana	13	341	2,489	7·30
Warcowie	20	1,183	6,421	5·43
County Hanson	20	13,532	71,518	5·29
IV. SOUTH-EASTERN DIVISION.				
1. County Cardwell, Hundred of—				
Coombe	20	1,381	9,844	7·13
Laffer	4	374	3,700	9·89
County Cardwell	20	2,557	17,686	6·92
2. County Buckingham, Hundred of—				
Archibald	8	139	728	5·25
Cannawigra	20	605	3,821	6·32
Pendleton	19	573	4,273	7·46
Senior	13	228	1,656	7·25
Stirling	20	5,650	55,232	9·78
Tatiara	20	12,779	240,046	18·79
Willalooka	1	75	600	8·00
Wirrega	20	7,769	121,427	15·64
County Buckingham	20	27,555	425,982	15·46
3. County MacDonnell, Hundred of—				
Binnum	20	1,845	18,571	10·07
Glen Roy	11	119	1,784	14·98
Hynam	20	1,758	28,472	16·20
Lochaber	20	1,218	19,922	16·36
Parsons	15	52	469	9·08
County MacDonnell	20	4,943	68,466	13·85
4. County Robe, Hundred of—				
Conmurra	20	89	791	8·90
Comaum	20	651	8,358	12·84
Jessie	20	2,253	25,554	11·34
Joanna	20	861	10,241	11·90

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
IV. South-Eastern Division—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Robe, Hundred of—*continued.*				
Joyce	20	451	4,268	9·46
Killanoola	14	550	8,173	14·86
Mount Benson	12	75	561	7·53
Naracoorte	20	515	5,469	10·62
Robertson	20	409	5,602	13·70
Ross	3	119	629	5·27
Spence	18	121	928	7·68
Townsend	20	105	923	8·83
Waterhouse	6	17	66	3·82
County Robe	20	5,903	68,311	11·57
5. County Grey, Hundred of—				
Benara	13	105	1,276	12·16
Blanche	20	215	4,237	19·74
Caroline	17	86	1,318	15·25
Gambier	18	147	3,709	25·19
Grey	20	186	2,928	15·73
Hindmarsh	9	775	15,880	20·49
Kennion	19	178	2,218	12·46
Kongorong	15	84	818	9·76
MacDonnell	20	93	1,143	12·31
Mayurra	9	696	11,309	16·25
Migbool	6	41	408	10·06
Monbulla	20	242	3,083	12·76
Mount Muirhead	9	1,992	44,650	22·41
Nangwarry	1	4	76	19·00
Penola	20	167	2,137	12·83
Rivoli Bay	7	182	1,823	10·00
Riddoch	6	27	211	7·90
Short	1	12	120	10·00
Symon	9	322	3,402	10·58
Young	19	83	1,181	14·22
County Grey	20	3,905	68,970	17·66
V. WESTERN DIVISION.				
1. County Hopetoun, Hundred of—				
Caldwell	20	1,140	4,679	4·12
Miller	20	2,598	16,436	6·33
Sturdee	18	3,020	13,105	4·34
Wokata	20	4.610	26,639	5·78
County Hopetoun	20	11,669	65,670	5·63
2. County Kintore, Hundred of—				
Bagster	20	7,316	37,282	5·10
Burgoyne	20	4,610	20,890	4·53
Cohen	20	6,813	32,649	4·79
Giles	20	1,587	7,961	5·02
Kevin	20	1,400	6,038	4·31
Keith	20	2,356	11,021	4·68
Magarey	20	873	3,950	4·52
Nash	20	1,144	5,626	4·92
County Kintore	20	26,082	125,360	4·81
3. County Way, Hundred of—				
Bartlett	20	4,375	19,842	4·54
Blacker	20	4,783	23,976	5·01
Bonython	20	6,161	26,337	4·27
Catt	20	7,786	47,227	6·07

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
V. Western District—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Way, Hundred of—*continued.*				
Chillundie	20	7,254	35,813	4·94
Goode	20	14,503	70,745	4·88
Guthrie	20	7,227	44,736	6·19
Horn	20	5,231	23,639	4·52
Moule	20	8,359	43,658	5·22
O'Loughlin	20	5,160	24,457	4·74
Wallanippie	20	5,691	30,824	5·42
Wandana	20	13,419	66,136	4·93
County Way	20	89,868	460,034	5·12
4. County Dufferin, Hundred of—				
Carawa	20	4,465	21,336	4·78
Hague	20	1,974	10,609	5·37
Haslam	20	7,032	41,499	5·90
Koolgera	16	2,210	9,515	4·31
Nannyah	11	2,277	13,458	5·91
Perlubie	20	8,057	46,730	5·80
Petina	20	9,870	69,200	7·01
Pureba	11	805	4,800	5·96
Wallala	18	7,225	34,902	4·83
Waipuppie	20	11,780	64,213	5·45
Yantanabie	20	5,350	26,878	5·02
County Dufferin	20	58,535	330,237	5·64
5. County Robinson, Hundred of—				
Campbell	20	1,786	31,149	7·36
Carina	18	6,045	35,678	5·90
Chandada	20	7,487	45,284	6·05
Condada	16	3,073	17,382	5·66
Cungena	20	14,112	78,020	5·53
Downer	20	670	6,247	9·33
Finlayson	20	7,900	43,782	5·54
Forrest	20	5,273	38,529	7·31
Inkster	18	4,618	32,824	7·11
Karcultaby	18	4,949	27,054	5·47
Kaldoonera	18	7,122	45,864	6·44
Moorkitabie	8	2,196	8,755	3·99
Murray	20	2,555	17,868	6·98
Ripon	20	7,213	37,123	5·15
Rounsevell	20	4,891	49,304	10·08
Scott	20	7,931	52,781	6·66
Tarlton	20	9,840	56,288	5·72
Travers	20	5,960	30,949	5·19
Wallis	20	2,171	14,689	6·76
Witera	20	5,457	47,244	8·66
Wrenfordsley	20	4,693	37,937	8·08
Wright	20	2,980	19,836	6·66
County Robinson	20	114,050	729,802	6·40
. County Bosanquet, Hundred of—				
Pildappa	8	5,641	31,052	5·53
7. County Le Hunte, Hundred of—				
Cocata	4	680	4,127	6·07
Cootra	6	13,644	63,019	4·62
Kappacoola	18	3,297	16,905	5·13
Koongawa	6	4,564	25,413	5·57
Mamblin	17	3,788	15,100	3·96

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
V. Western District—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Le Hunte, Hundred of—*continued.*				
Minnipa	19	8,542	62,176	7·28
Palabie	19	7,168	38,203	5·33
Pinbong	10	5,317	23,653	4·45
Pordia	7	2,064	10,369	5 02
Pygery	20	13,763	94,176	6·84
Wannamana	20	10,984	60,745	5·53
Warramboo	18	8,286	43,197	5·21
Wudina	20	11,019	74,663	6·78
Yaninee	20	7,398	52,117	7·05
County Le Hunte	20	80,725	486,859	5·80
8. County Buxton, Hundred of—				
Barna	14	4,292	14,411	3·36
Buckleboo	9	13,507	60.175	4·46
Caralue	11	6,924	30,738	4·44
Cortlinye	20	16,262	101,072	6·22
Cunyarie	9	10,690	38,673	3·62
Kelly	20	13,512	108,962	8·06
Moseley	19	8,488	34,496	4·06
Panitya	6	679	3,135	4·62
Pinkawillinie	10	14,212	66,530	4·68
Solomon	20	9,553	64,612	6·76
Wilcherry	7	1,381	6,396	4·61
Yalanda	7	251	923	3·67
County Buxton	20	72,987	415,854	5·70
9. County York, Hundred of—				
Ash	20	627	3,392	5·41
Batchelor	11	200	557	2·78
Poynton	13	279	1,403	5·03
Randell	18	190	703	3·70
County York	20	1,051	5,812	5·05
10. County Musgrave, Hundred of—				
Barwell	14	2,012	13,677	6·80
Colton	20	6,616	58,414	8·83
Cowan	4	3,268	16,344	5·00
Haig	6	20	88	4·40
Kiana	20	1,432	11,821	8·25
McLachlan	20	8,337	73,554	8·82
Mitchell	20	3,856	30,026	7·79
Peachna	6	12,144	58,297	4·80
Pearce	5	148	2,121	14·33
Shannon	20	9,706	116,233	11·98
Squire	18	131	1,187	9·07
Talia	20	1,383	11,968	8·66
Tinline	20	376	3,596	9·56
Ulyerra	7	3,486	13,540	3·85
Ward	20	2,460	20,893	8·49
Way	20	266	2,290	8·62
County Musgrave	20	38,510	351,465	9·13
11. County Jervois, Hundred of—				
Boonerdo	5	2,806	11,833	4·22
Boothby	20	6,336	36,746	5·80
Brooker	20	4,433	40,626	9·17
Butler	20	8,161	84,558	10·36
Campoona	20	1,839	13,949	7·58

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
VI. Murray Mallee Division—*continued.*	Nos.	Acres.	Bushels.	Bushels.
2. County Hamley, Hundred of—				
Katarapko	5	826	1,594	1·93
Renmark	10	357	1,506	4·22
Berri	5	180	746	4·14
Cobdogla	5	1,350	4,565	3·29
County Hamley	14	1,132	3,597	3·18
3. County Albert, Hundred of—				
Bakara	20	15,021	87,541	5·83
Bandon	20	12,583	70,003	5·56
Cadell	20	5,597	28,220	5·04
Chesson	20	13,367	83,050	6·21
Forster	20	9,292	57,237	6·16
Holder	20	16,527	78,665	4·76
Mantung	20	18,908	102,062	5·40
Mindarie	20	15,240	94,661	6·21
Moorook	20	21,936	119,609	5·45
Murbko	20	5,324	34,711	6·52
Nildotti	20	11,120	68,631	6·17
Paisley	20	5,744	33,033	5·75
Waikerie	20	13,684	62,137	4·54
County Albert	20	164,328	923,043	5·62
4. County Alfred, Hundred of—				
Allen	20	20,431	118,444	5·80
Bookpurnong	20	53,238	407,458	7·65
Gordon	20	28,470	243,916	8·57
Kekwick	20	20,922	130,490	6·24
McGorrery	20	20,545	149,974	7·30
Murtho	20	5,614	35,695	6·36
Paringa	20	12,335	75,959	6·16
Pyap	20	33,690	263,915	7·83
County Alfred	20	195,225	1,427,862	7·31
5. County Chandos, Hundred of—				
Allenby	20	5,997	54,106	9·02
Auld	11	4,431	15,009	3·39
Bews	20	29,733	348,165	11·71
Billiatt	9	893	3,045	3·41
Cotton	20	21,012	214,686	10·22
Kingsford	15	7,195	32,342	4·49
Parilla	20	27,081	270,145	9·98
Peebinga	16	9,289	41,756	4·50
Pinnaroo	20	36,022	435,872	12·10
County Chandos	20	135,639	1,351,767	9·97
6. County Buccleuch, Hundred of—				
Bowhill	20	5,432	41,035	7·55
Coneybeer	20	1,316	8,147	6·19
Hooper	20	13,152	99,049	7·53
Kirkpatrick	20	810	4,180	5·16
Lewis	13	373	2,537	6·79
Livingstone	20	3,106	16,574	5·34
Marmon Jabuk	20	10,445	67,007	6·42
Molineux	20	7,470	44,426	5·95
McPherson	20	12,175	72,975	5·99
Peake	20	8,661	59,665	6·89
Price	20	13,056	113,589	8·70
Roby	20	6,963	47,068	6·76
Sherlock	20	5,979	34,138	5·71

TABLE V.—continued.

Names of hundreds in which mean yields per acre are less than 6bush. are printed in heavier type, and hundreds in which mean yields are 12bush. and over are printed in italics.

	Number of Seasons.	Mean Area per Annum.	Mean Production per Annum.	
			Total.	Per Acre.
VI. Murray Mallee Division—*continued.*	Nos.	Acres.	Bushels.	Bushels.
County Buccleuch, Hundred of—*continued.*				
Strawbridge	12	76	422	5·56
Vincent	20	9,409	56,482	6·00
Wilson	20	13,456	93,185	6·93
County Buccleuch	20	111,394	757,251	6·80
7. County Russell, Hundred of—				
Baker	19	110	698	6·36
Bonney	20	238	1,562	6·57
Burdett	20	4,343	26,553	6·11
Coolinong	20	1,334	9,306	6·98
Ettrick	20	4,102	21,794	5·31
Malcolm	20	1,115	8,563	7·68
Seymour	20	4,935	30,070	6·09
Younghusband	20	8,418	54,317	6·45
County Russell	20	25,371	154,094	6·07

SOUTH AUSTRALIAN F.A.Q. WHEATS.

The Acting Director of Chemistry (Mr. C. E. Chapman) has submitted to the Minister of Agriculture (Hon. A. P. Blesing, M.L.C.) the following report on the results of the milling, chemical and baking tests on the 1935-36 season's F.A.Q. wheat.

WHEAT.

	1934-33.	1934-35.	1935-36.
Moisture	9·9%	10·1%	10·8%
Impurities (Screenings, &c.)	—	4·2%	4·0%
Protein (N x 5·7)	11·1%	10·7%	11·1%
Bushel Weight	60lbs.	60½lbs.	63½lbs.
Flour Yield	71·1%	70·8%	72·1%

The Protein was calculated on wheat containing 10 per cent. moisure.

FLOUR.

	1933-34.	1934-35.	1935-36.
Ash	0·44%	0·44%	0·45%
Protein (N x 5·7)	9·2%	8·3%	9·1%
Wet Gluten	24·2%	23·8%	27·3%
Dry Gluten	8·6%	8·1%	9·0%
Water Absorption	56·0%	56·0%	56·0%
Hydrated Maltose	1·36%	1·70%	1·55%
Colour	Excellent	Excellent	Very Good
Standard Loaf Volume	437mls.	425mls.	442mls.
Standard Loaf Weight	133·4 grams	131·4 grams	131·1 grams

The analyses of the flour were calculated on flour containing 13·5 per cent. moisture.

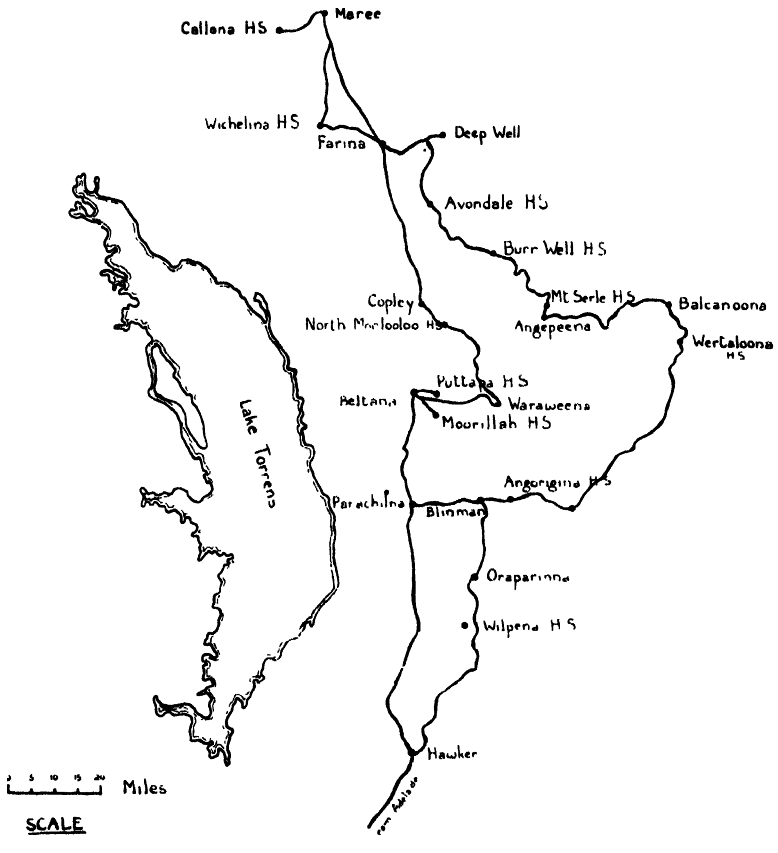
The figures obtained show that this season's wheat is of superior quality to that grown last season, and is equal to that of the year 1933-34.

Unfortunately there are no complete records of tests made on South Australian F.A.Q. Wheat previous to that of 1933-34, and therefore it is not possible to determine whether there has been a decline during recent years in the quality of South Australian Wheat. It is, however, gratifying to note that there is a decided improvement in this season's sample when compared with that grown the previous season.

A PRELIMINARY SURVEY OF THE FAR NORTH DISTRICT AS A POSSIBLE ENDEMIC AREA FOR PLAGUE GRASSHOPPERS.

[By H. G. Andrewartha, Waite Agricultural Research Institute, University of Adelaide.]

A previous paper discussed preliminary surveys of the north-eastern pastoral district and the north-western (Gawler Ranges) district.* During the present trip a survey was made of the area made up of the Flinders Ranges and the plains immediately to the west and east of them. The accompanying sketch map shows the route which was followed. As in previous surveys, information obtained from making collections at intervals along the route, was supplemented by conversation with pastoralists living in the district.



SKETCH MAP.

Showing route followed in survey of the Far North pastoral district, April, 1936.

The whole of the area which was traversed is at present suffering from drought; it had a desolate, drought-stricken appearance, the plains to the west of the ranges appearing even more barren than the ranges. Yet *Chortoicetes terminifera* was present over the whole area. It was strikingly the dominant species. Certain other *Acridids* were present in limited numbers in specialised habitats (*e.g.,* in ti-tree or gum creeks), but *Chortoicetes* appeared to be the only occupant of the more generalised type of habitat such as the open plain, the stony hillside, the flat water-course or depression, or the crab-hole. It was found in all these places. No attempt was made to form a quantitative estimate of the density of the grasshoppers. They occurred only sparsely in the more barren places, such as stony plains or hillsides, where there seemed to be little or no food for them. In such situations one or two adults might be disturbed in a mile. They tended to be more numerous in local areas (such as crab-holes, creek beds, and depressions) where there was a little green herbage; but nowhere were they observed to be at all dense or to show any tendency towards gregariousness. In certain of these areas the density was such that an adult might be disturbed every two or three yards.

There was no uniformity in the plants growing on those small areas in which *Chortoicetes* appeared to be concentrated. In some, saltbush (*Atriplex*) was dominant, in others various grasses and in others there was a wide variety of herbaceous plants. The general impression was that the nature of the plant was unimportant; so long as it could provide green food it was attractive to the grasshopper.

Another striking feature of the *Chortoicetes* population was the unusually high proportion of large green forms. No quantitative figures are available but the general impression gathered was that more than 50 per cent. of the individuals seen were green or tending to be greenish.

It was not possible to trace back the history of the last outbreak in this district with sufficient accuracy. There can be little doubt that there were swarms of *Chortoicetes* flying in the Flinders Range in the spring of 1934. Some, at least, of these were bred locally, from eggs which were laid probably in the autumn of that year. There is some evidence that grasshoppers were dense (but not gregarious) in the spring of 1931. There is no record from the Flinders Ranges of swarms during 1932 or 1933. At Callana (west of Maree) a swarm was observed flying in a southerly direction, probably about May of 1933. It seems probable that the Flinders Ranges district was not an important intermediate breeding ground during the outbreak which reached its climax in the wheat belt in the spring of 1934.

* 1936, Andrewartha, H. G.: *Journ. Agric. Sth. Australia,* Vol. 39, p. 1031.

FOOTROT IN SHEEP.

At the April meeting of the Koppio Branch Mr. F. Whittaker spoke on footrot in sheep. He had had experience of footrot, and considered it to be the worst disease that sheep could become affected with. It was difficult and expensive to cure, involving constant attention to the infected animals and isolation from the remainder of the flock. He recommended a footbath solution of 1lb. of bluestone to 2galls. of water, the sheep being treated in a trough once a fortnight until cured. The hoof should be cut away and cleaned, with all abscesses drained and dressed with a disinfectant solution of Stockholm tar and lysol. Footrot might occur in the district when top-dressing became universal practice and more feed was grown on low-lying, muddy country. He had seen footrot in a district of 17in. rainfall.

RED LETTER DAYS

IN

South Australia's Centenary Calendar

SEPT. 5 to SEPT. 12.

Royal Spring Show

7 Days and 7 Nights.

ENTRIES CLOSE–

MONDAY, JUNE 1.

Agricultural Produce.

FRIDAY, JULY 3.

S.A. Industries and Manufactures, including Apiculture, Needlework, Knitting, Cooking, Artcrafts, etc. Dairy Produce.

THURSDAY, JULY 30.

Cattle, Sheep, Wool, Fat Stock, Horses (Heavy, Roadster, Blood), Swine Judging Competitions, Sheaf Tossing.

TUESDAY, AUGUST 4.

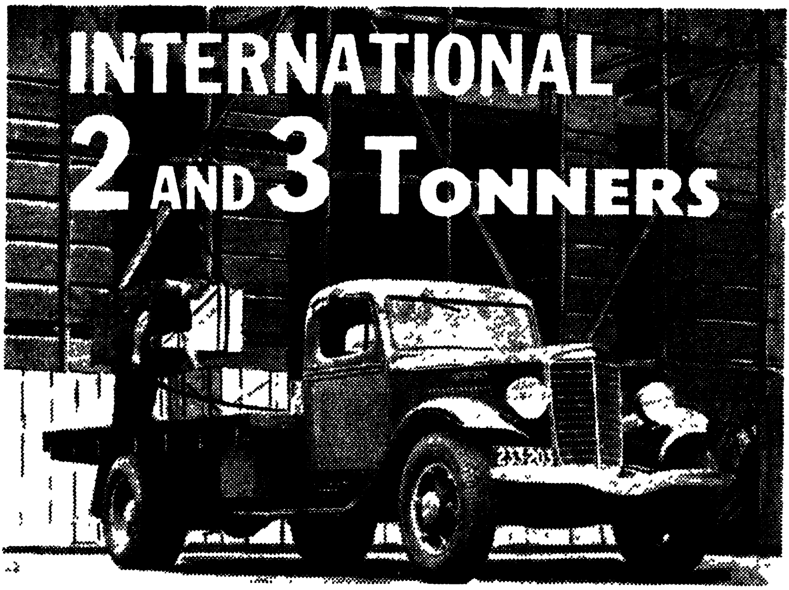
Poultry, Pigeons, Dogs, Eggs.

THURSDAY, AUGUST 6.

Horses-in-Action, Trotting.

Prize-Lists and Entry Forms are obtainable from the offices of the Royal Agricultural and Horticultural Society, Eagle Chambers, Pirie Street, Adelaide.

HAROLD J. FINNIS, Secretary.



. . . Dreadnoughts of the highway

★The balanced lines of International 2-ton, Model C-35 indicate a well-designed heavy-duty truck with plenty of flexible power and load weight evenly distributed. It rides easily, loaded or empty, on its long, flexible semi-elliptic rear springs and auxiliary springs . . . all engine and transmission parts are of long-proved International truck quality . . . The frame has pressed steel channels tapered at both ends to secure low loading height . . . Numerous cross members are gusseted to the side rails, ensuring rigidity of frame—A great truck for all-round heavy haulage.

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INTERNATIONAL TRUCKS

PIG PRODUCTS IMPORTED BY THE UNITED KINGDOM IN 1935, EXTRACTS FROM REPORTS OF THE IMPERIAL ECONOMIC COMMITTEE.

A.—Bacon.

In 1935, Denmark was much the most important source of imported bacon, but shipments were reduced by 11 per cent. on the 1934 figures. Canada, the second largest source continued to advance, and imports from this country were 3 per cent. higher than in the previous year, while there was a further increase of 25 per cent. in imports from the Irish Free State. Imports from most other principal foreign sources of supply declined. The arrangement allowing foreign countries not specifically restricted to ship not more than 400cwts. bacon per week encouraged several countries which previously scarcely figured as sources of supply, and of these some Southern European countries and France showed the greatest relative increase.

Imports of Bacon into the United Kingdom.

Consigning Country.	1933.	1934.	1935.
	cwts.	cwts.	cwts.
Canada	506,906	894,284	917,883
Irish Free State	204,303	367,799	458,423
Australia	93	5	332
Other Empire Countries	71	963	313
Denmark	5,524,217	4,287,830	3,826,386
Netherlands	872,750	607,704	508,669
Poland	783,735	463,369	430,456
Sweden	402,912	296,641	257,409
Lithuania	415,520	251,572	165,318
Soviet Union	44,184	48,724	46,509
Estonia	62,978	50,675	45,521
Latvia	46,248	43,111	32,810
Argentina	42,642	27,174	28,414
Finland	50,776	24,138	22,292
Yugoslavia	20	16,244	21,188
Rumania	—	19,892	20,912
Hungary	1,970	21.063	20,793
Brazil	3,390	13,072	20,528
Norway	25,985	24,991	20,290
United States of America	62,901	39.514	20,011
Bulgaria	—	—	16,944
Belgium	5,501	21,915	12,858
Switzerland	3	6,558	12,273
France	—	13	8,744
Luxemburg	—	—	6,134
Czecholsovakia	—	7,211	3,651
Austria	—	12,299	531
Germany	26,474	51,323	—
Other Foreign Countries	774	178	62
Total all Countries	9,084,353	7,598.262	6,925.654

The prices of Bacon at London were on the average throughout the year slightly lower than in 1934.

Average Price of Bacon at London.

	1934.	1935.
	per cwt. s. d.	per cwt. s. d.
English Sizeable, No. 1	93 0	91 6
Danish Sizeable, No. 1	88 3	88 6
Canadian Sizeable, No. 1	81 3	79 6

B.—HAMS.

As with bacon the Empire share of the trade in imported hams has expanded in the past few years, of which the greatest increase was for Canada.

Imports of Hams into the United Kingdom.

Consigning Country.	1933.	1934.	1935.
	cwts.	cwts.	cwts.
Canada	179,652	180,717	190,832
Irish Free State	20,206	13,083	20,207
Other Empire Countries	7	1	3
United States of America	564,225	477,503	419,112
Poland	74,055	33,118	21,870
Argentina	29,957	20,978	20,153
Brazil	—	2,150	3,489
Italy	228	296	309
Netherlands	9	123	281
Denmark	280	6	130
Czechoslovakia	58	68	123
Other Foreign Countries	137	230	270
Total all Countries	868,814	728,273	676,779

C.—FRESH PORK.

All imports of fresh pork into the United Kingdom are from the Irish Free State, and although the decline in imports from this source were very considerable from 1932, when 262,151cwts. were imported, they were in 1935, about the same as in 1934. The imports in 1933 were 194,695cwts., in 1934 they were still further reduced to 143,771cwts., and in 1935 amounted to 142,841cwts.

D.—CHILLED AND FROZEN PORK.

New Zealand and Australia are particularly interested in the import trade of the United Kingdom in Chilled and Frozen Pork, and the most marked feature of the trade in recent years has been the rapid development of supplies from these countries. Empire supplies increased by 23 per cent. in 1935, and accounted for 70 per cent. of all imports.

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Journal of Agriculture, January and July, 1921.

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Imports of Chilled and Frozen Pork into the United Kingdom.

Consigning Country.	1933.	1934.	1935.
	cwts.	cwts.	cwts.
New Zealand	278,047	414,275	490,327
Australia	65,567	82,425	146,732
Canada	18,825	27,134	7,588
Other Empire Countries	32	66	68
Argentina	166,017	277,526	186,841
United States of America	83,559	290,365	77,079
Brazil	10,729	12,955	6,121
Uruguay	—	674	463
Total all Countries	622,776	1,105,420	915,219

The average prices of New Zealand Pork in London was in 1935, for carcases weighing 60lbs. to 80lbs., at 6d. per lb.; for those weighing 81lbs. to 100lbs., at 5⅝d. per lb.; and for 101lbs. to 120lbs. carcases, at 5½d. per lb.

PAPERS READ AT CONFERENCES.

LOWER SOUTH-EAST, KYBYBOLITE, 8TH APRIL, 1936.

OUR KYBYBOLITE EXPERIMENTAL FARM.

[E. C. H. Schinckel (Kybybolite).]

Comprising an area of 1,000 acres surrounding the homestead of the old Kybybolite Estate, it was established as an experimental farm in 1906, just 30 years ago. Its original experiments were conducted in the growing of cereal crops, but in recent years, through the sowing of Subterranean Clover and various grasses with manurial dressings, a transformation has taken place, and we see it to-day devoted almost entirely to improved pastures and livestock.

One is here reminded of wise words spoken by our Director, Professor Perkins, before pasture improvement or top dressing was seriously attempted in this district. Unimpressed by the possibilities of successful wheat growing, we were told that our farms eventually must be converted into livestock propositions with pasture development. Wise counsel indeed, and surely Kybybolite must remain among the most pleasant recollections of his efforts that he carries with him from office. Efforts that I am sure every producer in the State is ready to acclaim.

I am indebted to Mr. Cook, the Manager, for statistics showing the development that has taken place since 1921, when pasture improvement was first undertaken. To simplify, it is set out in 5-year periods as follows:—

Sheep.

Period.	Av. No. Carried Per Annum.	Av. No. Ewes Mated Per Annum.	Av. Annual Wool Production. Lbs.
1921-26	592	338	3,496
1926-31	1,057	490	7,802
1931-36	1,587	768	13,131

At present there are 1,800 sheep on the farm and nearly 1,000 ewes mated.

BIG STOCK.

Period.	Av. No. Cattle Carried Per Annum.	Av. Annual Cream Production. Lbs.	Av. No. of Horses.
1921-26	68	10,342	35
1926-31	108	21,062	34
1931-36	137	23,136	24

For the period 1935-36 the Farm carried 147 cattle, 22 horses, and produced 26,430lbs. of cream. These figures speak for themselves, and show that to-day the property is in a very high state of production.

To the visitor unaccustomed to the sight of highly-improved pastures our Farm presents—particularly in the spring months of the year—an impression that we are nearing the millenium. I plead guilty myself to such an impression when first I saw the magical combination of Subterranean Clover and superphosphate. In fact, one hears not infrequently—from unthinking people, I admit—that our Farm has done all it can, and has outlived its usefulness. To the writer, however, it has not commenced to live. The title of this paper is "Our Experimental Farm." I look forward to the day when it shall be known as the Kybybolite Research Farm, equipped with a complete staff of highly-qualified research workers.

I know these remarks will be received with derision by some, but those experienced in pasture development and with an appreciation of the potentialities of the South-East and other vast areas in the southern coastal regions of the Commonwealth, will realise the urgent need for more intense research work, and it is with this hope that I contribute this paper.

The Health of Livestock.

A great deal of useful and interesting experimental work in pasture improvement is being carried out at the Farm at the present time, but the full value and the greatest value of these experiments—I refer to nutrition and health of stock—cannot be determined because of the lack of facilities thoroughly to test out the experiments.

It is a known fact that quite a number of landholders are retarding the development of their properties because they fear, rightly or wrongly, the introduction of fresh ailments to their stock.

That the running of 4 or 5 sheep where one previously grazed will bring some trouble is only natural, but the gains from pasture improvement so outweigh the losses that we are not going to revert to the old conditions; for it has been the writer's experience that for every sheep lost on our clover pastures 10 died for want of it. Nevertheless, we must admit that troubles do exist, and will increase with the heavier stocking which is bound to continue.

The question of liming and its bearing on the health of stock is in my opinion one requiring urgent investigation; in fact, this question is becoming an obsession with the writer.

Knowing our soils to be deficient in calcium, a certain amount of experimental work with lime has been done on the Farm, but only as it affects plant production, and results show its use at present prices to be uneconomical. But its value in regard to health of stock—probably where its real value will be found—has never been tested. I feel convinced that lime in the manurial treatment of our pastures will become an essential factor in the healthy development of our stock.

In a recent issue of a leading Victorian weekly, there appeared in its agricultural columns a report on pasture improvement on a well-known grazing property in that State, and it is the assertion of its owner "That since he adopted the use of lime in conjunction with superphosphate as a manurial dressing there has not been a case of milk fever, mammitis, or any other disease among dairy cattle, or an infestation of sheep or cattle with animal parasites." A remarkable assertion, sufficient to make us urge for a more thorough investigation into the use of lime in the manurial treatment of pastures in these parts of our State.

If our Farm could establish the claim of this Victorian landholder it would not be difficult to imagine the benefit this district alone would derive.

The cash value of experimental or research work is inestimable; though I do remember when Federation wheat, for instance, was first introduced into Victoria —it was estimated that the increased yield obtained from this variety was worth £200,000 per annum to the wheatgrowers of that State.

Recent Wheat Crop Competitions in this State show Roseworthy College bred wheats to be well in the front of the prolific yielders. If the cash value of these increased yields could be computed and credited to its rightful source, Roseworthy College would show some handsome balances.

Who could place an estimate of the increase in wealth in our own State, or even in our own district, due to the advent of superphosphate, the result of scientific research?

We seem ever ready to avail ourselves of the material advantages and comforts that science has handed to our civilisation, but seldom to realise or express appreciation of the wealth it pours into the lap of the community. Should we not urge, then, for an extension of this work at our own Farm, the need for which is so apparent?

Truly much helpful laboratory work is being done, and I do not wish to detract from or underestimate the value of the work of the analytical chemist, but one does wonder at times if we are paying a little too much regard to high nutritive values in our pasture plants and overlooking something either in lower values or manurial treatment that might better the health of our stock. Only field tests can ascertain this, and we must rely on our research workers for such help.

It is interesting here to note that the question of nutrition is a matter of world-wide concern to-day. Our own High Commissioner, Mr. Bruce, as readers of our leading dailies will observe, has appealed to the League of Nations for the co-operation of all countries towards the realisation of the ideal of "marrying health and agriculture." Mr. Lyons promises an inquiry, and says Australia will not be behind other nations in investigating her own conditions and contributing to the general knowledge.

Considering that the human and animal structures are built and sustained by products of the soil, such an inquiry should have far-reaching effects, not only in a material sense, but in the more important aspect of its bearing on the health of the community.

Agricultural Research.

One does not have far to look to realise that Australia lags far behind other countries in its agricultural research work. Compared with South Africa, the sum spent on such work is infinitesimal, while our own State spends only a fraction of that spent by Victoria, though South Australia depends to a far greater extent on its primary industries. Yet it is pleasing to note that our own Experimental Farm is in the van so far as pasture work is concerned, and its work seems to be of a more practical nature than that of similar institutions in Australia.

The fact that its work is published in leading scientific journals overseas, and inquiries are received from some of the leading farming countries of the world regarding its experiments, is evidence of growing interest and appreciation of its work. A glance at the visitors' book reveals the names of many interstate visitors, and not a few from overseas, including Downing Street. The high percentage of Victorian visitors is noticeable, and a great deal of interest is manifested by Western District landholders in particular. To those of us familiar with the southern portions of the State of Victoria, this is not surprising, for conditions there, generally speaking, approximate very closely to our own in relation to soil and rainfall.

As great as the influence of our Experimental Farm will have on the development of pastures in the South-East, one sees an even wider sphere in that wonderful stretch of country embracing practically the southern half of Victoria; in fact, one could include similar areas in New South Wales and Western Australia where Subterranean Clover is being used in the development of pastures.

The writer believes that this clover will be recognised as the basic plant in all pasture development in the major portion of the areas mentioned, especially on soils showing a calcium deficiency.

Now this raises the question whether in view of the wide sphere of influence of our Farm the cost of maintaining such an institution should not be contributed to by other States receiving benefits from its work, though the writer contends that it should be established as a National Research Farm backed by the Commonwealth Government.

In view of this Government's attitute toward the nutrition problem, I think immediate steps should be taken to have it established as such, and a strong case could be presented for the following main reasons:—

1. Its adaptability to practical field work.

2. Its approximation to soil and seasonal conditions of a tremendous area of the southern coastal country of the Commonwealth where pasture improvement is gradually developing.

3. The valuable data already collected through its experimental work gives it a long lead over any other institution of its kind in Australia.

To me the stage is set at our Experimental Farm for the expansion of research work of great national importance—work that is urgently needed, because I believe that to-day our advanced pasture men have got ahead of the scientists. I mean that he has brought his pastures to such a high state of productivity through the use of superphosphates alone that he does not know where to look for help in the troubles that have come in its wake, and we look anxiously but in vain for such assistance merely because of lack of research work being done.

Truly the farmer can do a certain amount of experimental work for himself, but he cannot get far without the research worker, and as a close observer of our Experimental Farm I should like to see it devoted to this work entirely.

I wish my remarks not to be construed as criticism of the management of the Farm under Mr. Cook, but would like here to express appreciation of his ability and keenness for his work which is outstanding in Australia to-day. I do criticise the limitation of the scope imposed on our Farm through lack of funds and facilities more thoroughly to carry out his important work.

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk. Per Herd during March.	Milk. Per Cow during March.	Milk. Per Cow July to March.	Butterfat. Per Herd during March.	Butterfat. Per Cow during March.	Butterfat. Per Cow July to March.	Average Test.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H .	8	7	3,084½	385·56	4,326·89	155·68	19·46	222·23	5·05
7/P ..	32·42	28·97	16,871	520·38	5,244·47	738·01	22·76	240·09	4·37
7/Tt .	17	16·45	8,399½	494·08	5,766·55	350·15	20·60	241·29	4·17
7/Ddd	13·61	12·39	6,803½	499·88	6,189·13	290·23	21·32	289·85	4·27
7/Bbb	78·26	69·03	32,833	419·54	4,641·01	1,334·34	17·05	202·50	4·07
7/Eee	12·65	5·87	2,857½	225·88	4,516·15	128·74	10·18	223·82	4·51
7/Ggg	18	14	5,332	296·22	4,021·16	251·60	13·98	184·44	4·72
7/Hhh	14	13·74	4,957½	354·10	5,194·91	169·18	12·08	169·67	3·41
7/Iii .	18·97	17·26	11,127	586·55	5,783·15	375·88	19·81	199·22	3·38
7/Kkk	27	24·06	10,424	386·07	5,453·01	460·58	17·06	255·13	4·42
7/Mmm	16	14·23	5,700½	356·28	4,462·82	299·33	18·71	233·10	5·25
7/Nnn	16	11·14	7,195½	449·72	5,682·16	299·15	18·70	242·75	4·16
7/Ooo	24·74	21·77	10,426½	421·44	4,610·60	389·08	15·73	182·21	3·73
7/Ppp	17	12·61	5,258½	309·32	4,316·33	267·78	15·75	207·30	5·09
7/Qqq	22	18·58	4,749	215·86	4,950·63	239·36	10·88	230·98	5·04
7/Rrr	23	21·06	6,991½	303·97	4,363·18	387·55	16·85	194·89	5·54
7/Sss	8	6	3,735½	466·94	5,997·91	145·43	18·18	237·48	3·89
7/Ttt	8	6·55	3,869½	483·69	5,783·37	134·95	16·87	229·49	3·49
7/Uuu	23·81	17·55	5,499½	230·97	3,753·57	240·66	10·11	158·60	4·38
7/Vvv	20	19	8,153	407·65	4,498·30	363·84	18·19	197·48	4·46
7/Www	20	17·61	9,756½	487·83	3,561·06	414·01	20·70	146·76	4·24
7/Xxx	25·90	22·26	9,558½	369·05	3,325·58	373·01	14·40	126·63	3·90
Means	21·11	18·05	8,344·70	395·35	4,946·54	354·93	16·82	214·45	4·25

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk Per Herd during March.	Milk Per Cow during March.	Milk Per Cow October to March.	Butterfat. Per Herd during March.	Butterfat. Per Cow during March.	Butterfat. Per Cow October to March.	Average Test.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	32·58	16·29	10,271	315·25	3,645·52	562·19	17·26	194·59	5·47
5/D ..	31	16·55	10,235	330·17	2,882·58	539·68	17·40	154·95	5·41
5/E ..	38	31·10	19,134	503·53	3,233·47	1,035·13	27·24	168·11	5·41
5/R ..	69·74	47·42	22,402½	321·23	2,514·48	1,002·84	14·38	113·03	4·48
5/Z ..	42	35·84	28,286	673·47	3,945·02	1,415·32	33 70	204·38	5·00
5/Ee .	16	15·55	9,321½	582·59	3,976·93	491·07	30·69	200·75	5·27
5/Xx	26	13·16	4,485½	172·51	2,168·21	263·35	10·13	111·34	5·87
5/Yy	8·84	6·71	3,490½	394·85	2,038·97	182·66	20·66	102·76	5·23
5/Aaa	19·61	16·39	9,336½	476·11	3,494·46	496·07	25·30	173·75	5·31
5/Bbb	18	11·77	2,995	166·38	2,610·13	162·88	9·05	130·24	5·44
5/Eee	26·29	20·32	15,765	599·65	3,007·68	655·49	24·93	133·16	4·16
5/Hhh	13·52	10·16	4,543½	336·05	3,040·43	216·26	15·99	127·89	4·76
5/Jjj	26	6·94	3,528	135·69	1,855·42	200·88	7·73	115·59	5·70
5/Aa .	19·45	17·45	9,241½	474·82	3,229·95	414·14	21·28	141·10	4·51
5/Kkk	15·94	11·65	4,388½	275·31	1,857·95	223·07	13·99	89·43	5·08
5/Lll	16	11	4,448½	278·03	3,076·24	212·00	13·25	137·66	4·77
5/Rr	24	16·84	7,044	293·50	2,607·68	369·93	15·41	138·85	5·25
5/Mmm	32	25·39	14,997½	468·68	3,875·82	741·63	23·17	184·58	4·93
5/Nnn	24·61	19·68	7,679½	312·04	3,118·90	430·26	17·48	160·83	5·60
5/Ooo	23	22	20,475½	890·23	4,957·01	897·78	39 03	203·84	4·38
5/Ppp	29·68	15·35	7,876½	265·38	2,540·09	326·14	10·99	104·10	4·14
5/Qqq	29·61	27·06	10,202	344·54	2,483·30	580·94	19·62	131·10	5·69
Means	26·45	18·85	10,461·24	395·53	3,022·42	519·08	19·63	147·96	4·96

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk. Per Herd during March.	Milk. Per Cow during March.	Milk. Per Cow December to March.	Butterfat. Per Herd during March.	Butterfat. Per Cow during March.	Butterfat. Per Cow December to March.	Average Test.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	16	9·65	3,119	194·93	1,314·90	166·31	10·39	64·35	5·33
6/C ..	21·39	18·65	11,571	540·95	2,546·24	539·88	25·24	110·83	4·67
6/Y ..	14	14	10,957	782·64	3,383·57	505·61	36·12	142·55	4·62
6/Ff .	30·68	27·19	22,422½	730·85	3,115·10	873·06	28·46	129·78	3·89
6/Kk	16	11·58	7,934	495·87	1,932·36	285·92	17·87	76·50	3·60
6/Ll .	24	20	13,640	568·33	2,395·47	477·70	19·90	86·07	3·50
6/Oo .	21·52	16·06	11,937	554·65	2,987·04	491·59	22·84	127·97	4·12
6/Ss .	15·81	13·06	13,932	881·21	3,593·30	504·89	31·93	129·36	3·62
6/Tt .	28·32	25·94	17,454	616·81	2,950·56	732·27	25·86	124·58	4·20
6/Vv .	28·32	24·32	21,833	770·93	3,294·77	981·30	34·65	150·12	4·49
6/Xx	26·90	21·16	15,886	590·55	2,691·56	641·15	23·83	108·20	4·04
6/Ddd	25	21·97	15,448½	617·94	2,838·90	616·11	24·64	115·55	3·99
6/Mmm	10·97	9·94	10,177½	927·71	2,907·74	405·24	36·94	118·02	3·98
6/Ooo	29·42	24·90	22,490	764·44	3,285·73	935·65	31·80	140·02	4·16
6/Rrr	39·06	33·71	27,750½	710·55	2,866·59	1,071·56	27·43	109·98	3·86
6/Sss	37	30·13	25,573½	691·17	3,152·59	915·08	24·73	120·93	3·58
6/Ttt	24·68	19·19	15,104	611·99	2,495·36	704·01	28·53	114·25	4·66
6/Pp .	22	18·55	12,427	564·86	2,529·54	607·41	27·61	125·50	4·89
6/Uuu	65	60·26	41,908½	644·75	2,690·79	1,757·54	27·04	114·43	4·19
6/Vvv	41·39	35·84	22,929½	554·12	2,666·27	901·62	21·78	102·91	3·93
6/A ..	10	6	1,410½	141·05	1,287·20	80·94	8·09	67·68	5·74
6/Ppp	21·87	19·97	16,066½	734·63	3,277·36	699·29	31·97	136·17	4·35
6/Www	34	31·39	20,875½	613·98	—	792·76	23·32	—	3·80
Means	26·23	22·32	16,645·52	634·56	2,793·85	682·04	26·00	115·56	4·10

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk Per Herd during March.	Milk Per Cow during March.	Butterfat. Per Herd during March.	Butterfat. Per Cow during March.	Average Test.
			Lbs.	Lbs.	Lbs.	Lbs.	%
9/A	30	24·19	14,315	477·16	774·34	25·81	5·41
9/C..................	16	11·74	7,261	453·81	318·11	19·88	4·38
9/D	30	18·87	13,077	435·90	669·55	22·32	5·12
9/E	12	11·97	6,552½	546·04	303·02	25·25	4·62
9/F	17	7·81	3,232	190·11	141·65	8·33	4·38
9/I	28	18·13	5,588½	199·58	279·87	10·00	5·01
9/L	29·16	9·03	2,054½	704·55	102·47	35·14	4·99
9/O	23	18·26	7,166	311·56	320·26	13·92	4·47
9/P	44·48	7·77	1,999	449·41	110·02	24·77	5·51
9/W	28·81	22·65	14,514½	503·80	593·02	20·58	4·00
9/X	12·35	7·81	2,175	17·61	117·31	9·50	5·39
9/Y	12	7·26	3,855	321·25	145·29	12·11	3·77
9/Z..................	12	9·65	2,591	215·91	141·74	11·81	5·47
9/Aa	11	4·16	1,137½	103·40	68·67	6·24	6·03
9/Bb	31·26	30·26	18,809½	601·71	935·79	29·94	4·97
9/Ee	44·48	27·19	7,886	177·29	412·90	9·28	5·23
9/Gg	10	6·74	3,344½	334·45	190·04	19·00	5·68
9/Hh	12	8·39	2,063	171·91	109·84	9·15	5·32
9/II	37	34·26	12,384½	334·72	665·60	17·99	5·37
9/Kk	17	12·03	3,346	196·82	144·93	8·53	4·53
9/Jj	18	15	6,370½	353·91	299·29	16·62	4·69
9/Ll	11	—	All	cows	dry		
Means	22·12	14·24	6,351·02	287·18	311·08	14·07	4·90

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1936-37.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—***White Leghorns***— 351 *Birds Competing.*

Competitor.	Bird No.	First Grade Eggs. Progressive to 28th April, 1936.	Totals
A. G. Dawes, Portrush Road, Glenunga.	1	3	
	2	5	
	3	4	12
	4	1	
	5	11	
	6	14	26
			38
A. Young, Bridgewater.	7	5	
	8	11	
	9	12	28
	10	3	
	11	8	
	12	—	11
			39
H F. Muirson, Yundi.	13	—	
	14	3	
	15	4	7
	16	13	
	17	1	
	18	13	27
			34
T. E. Hincks, Echunga.	19	5	
	20	5	
	21	9	19
	22	8	
	23	4	
	24	13	25
			44
John Turner, Meadows.	25	15	
	26	15	
	27	7	37
	28	8	
	29	12	
	30	14	34
			71
T. Duhring, Mallala.	31	15	
	32	15	
	33	12	42
	34	13	
	35	9	
	36	13	35
			77
A. G. Dawes, Portrush Road, Glenunga. (Class No. 4.—Rhode Island Reds.)	37	16	
	38	8	
	39	10	34
	40	—	
	41	—	
	42	—	—
			34
J. O. Marshall, Yundi.	43	9	
	44	6	
	45	6	21
	46	7	
	47	8	
	48	1	16
			[illegible]
F. A. Merrett, Echunga	49	7	
	50	3	
	51	1	11
	52	11	
	53	18	
	54	18	47
			58
E. Portlock, Meadows.	55	15	
	56	15	
	57	6	36
	58	8	
	59	12	
	60	4	24
			60
E. O. Dorney, 16, Norseman Avenue, Westbourne Park.	61	15	
	62	3	
	63	7	25
	64	7	
	65	5	
	66	7	19
			44
A. E. Shiers, Yundi.	67	9	
	68	4	
	69	12	25
	70	18	
	71	6	
	72	12	36
			61
G. W. T. Symes, Echunga.	73	5	
	74	15	
	75	6	26
	76	5	
	77	6	
	78	11	22
			48
J. F. Smith, Meadows.	79	8	
	80	2	
	81	12	22
	82	12	
	83	11	
	84	2	25
			47
Arthur O. Dawkins, " Warrenbeyne ", Gawler.	85	19	
	86	16	
	87	16	51
	88	6	
	89	18	
	90	20	44
			95
Geo. Lomax, Yundi.	91	1	
	92	1	
	93	2	4
	94	5	
	95	7	
	96	7	19
			23

Egg-laying Competition—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
A. W. Mooney, Echunga.	97	—	
	98	9	
	99	2	11
	100	—	
	101	11	
	102	7	18
			29
H. C. Stacy, Meadows.	103	12	
	104	8	
	105	12	32
	106	10	
	107	10	
	108	3	23
			55
V. E. Williams, 57, Fairford Terrace, Semaphore Park.	109	18	
	110	13	
	111	8	39
	112	5	
	113	2	
	114	14	21
			60
T. R. Smart, Yundi.	115	14	
	116	—	
	117	13	27
	118	11	
	119	6	
	120	7	24
			51
C. T. Rodger, Echunga.	121	14	
	122	3	
	123	11	28
	124	16	
	125	6	
	126	9	31
			59
R. J. Underdown, Meadows.	127	9	
	128	13	
	129	13	35
	130	18	
	131	—	
	132	10	28
			63
B. Cooke, Kanmantoo.	133	—	
	134	14	
	135	14	28
	136	15	
	137	—	
	138	8	23
			51
W. M. Field, Yundi.	139	13	
	140	5	
	141	11	29
	142	4	
	143	8	
	144	12	24
			53
W. Restall, Echunga.	145	18	
	146	14	
	147	4	36
	148	3	
	149	9	
	150	4	16
			52
F. W. Gage, Meadows.	151	14	
	152	5	
	153	8	27
	154	11	
	155	13	
	156	5	29
			56
E. McKee, 5, Rose Street, Carrondown	157	13	
	158	11	
	159	11	35
	160	19	
	161	20	
	162	13	52
			87
W. C. Jones, Yundi.	163	10	
	164	6	
	165	14	30
	166	2	
	167	7	
	168	9	18
			48
D. J. Foxwell Echunga.	169	16	
	170	11	
	171	—	27
	172	10	
	173	6	
	174	12	28
			55
W Sickert, Meadows.	175	8	
	176	8	
	177	17	33
	178	10	
	179	4	
	180	9	23
			56
Willow Bend Stud Poultry Farm, North Walkerville.	181	2	
	182	17	
	183	7	26
	184	14	
	185	12	
	186	18	44
			70
C. Guthridge, Yundi.	187	—	
	188	12	
	189	1	13
	190	14	
	191	2	
	192	3	19
			32
S. Lambert, Echunga.	193	5	
	194	14	
	195	12	31
	196	6	
	197	5	
	198	17	28
			59
G. W. Sykes, Yundi.	199	9	
	200	15	
	201	—	24
	202	5	
	203	—	
	204	7	12
			36

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
J. J. Devlin, Meadows.	205	3	
	206	12	
	207	8	23
	208	1	
	209	1	
	210	2	4
			27
B. R. Whitington, Yundi.	211	9	
	212	7	
	213	12	28
	214	—	
	215	11	
	216	10	21
			49
L. A. King, Meadows.	217	11	
	218	7	
	219	—	18
	220	4	
	221	3	
	222	11	18
			36
W. R. Hedger, Yundi.	223	8	
	224	6	
	225	4	18
	226	15	
	227	—	
	228	—	15
			33
A. K. Suridge, Meadows.	229	1	
	230	—	
	231	8	9
	232	16	
	233	6	
	234	—	22
			31
J. C. Normandale Yundi.	235	5	
	236	7	
	237	9	21
	238	8	
	239	9	
	240	2	19
			40
E. G. Mitchell, Meadows	241	6	
	242	—	
	243	11	17
	244	4	
	245	7	
	246	11	22
			39
R. W. McAlister, Yundi.	247	14	
	248	1	
	249	10	25
	250	16	
	251	—	
	252	2	18
			43
C. R. Wharton, Meadows.	253	1	
	254	11	
	255	6	18
	256	5	
	257	11	
	258	9	25
			43
R H. Smith, Yundi.	259	4	
	260	6	
	261	5	15
	262	1	
	263	13	
	264	16	30
			45
F. J. Buck, Meadows.	265	—	
	266	2	
	267	12	14
	268	9	
	269	3	
	270	6	18
			32
E. B. Gliddon, Yundi.	271	13	
	272	6	
	273	10	29
	274	3	
	275	17	
	276	7	27
			56
C. MacDonald, Echunga.	277	16	
	278	20	
	279	7	43
	280	17	
	281	5	
	282	10	32
			75
J. A. Grist, Yundi.	283	12	
	284	8	
	285	—	20
	286	4	
	287	10	
	288	13	27
			47
J. M. Lawson, Meadows.	289	5	
	290	11	
	291	8	24
	292	9	
	293	5	
	294	11	25
			49
Willow Bend Stud Poultry Farm, North Walkerville	295	12	
	296	11	
	297	17	40
	298	14	
	299	12	
	300	15	41
			81
Murray Powell, Jupiter Creek.	301	3	
	302	13	
	303	5	21
	304	17	
	305	3	
	306	3	23
			44
W. H. L. Norman, Echunga.	307	17	
	308	10	
	309	12	
		39	

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
A. A. Schroeder, **Montarra.**	310 311 312	3 10 13	
		26	
C. A. Maxwell, **Aldgate.**	313 314 315	18 11 18	
		47	
B. T. Moyle, **Montarra.**	316 317 318	16 11 13	
		40	
J. H. Dowling, **Glossop.**	319 320 321	19 7 19	
		45	
C. P. Hill, **Montarra.**	322 323 324	20 1 12	
		33	
A. P. Urlwin, **Balaklava.**	325 326 327	9 1 10	
		20	
G. H. Stockwell, **Montarra.**	328 329 330	4 4 4	
		12	
A. W. McDonald, **Angle Vale Road,** **Gawler.**	331 332 333	19 7 12	
		38	
E. A. Collins, **Montarra.**	334 335 336	13 17 14	
		44	
E. M. Horrocks, **Clare.**	337 338 339	14 10 19	
		43	
H. A. Dedman, **Montarra.**	340 341 342	13 4 6	
		23	
E. M. Topperwein, **1, Medway Street,** **Fullarton Estate.**	343 344 345	3 17 5	
		25	
Jas. G. Slee, **Montarra.**	346 347 348	16 8 18	
		42	
A. S. Weaver, **Montarra.**	349 350 351	6 12 5	
		23	
F. R. Walker, **Montarra.**	352 353 354	16 13 2	
		31	
F. G. Kinnish, **Montarra,** ***via* Willunga.**	355 356 357	12 1 9	
		22	
Total Class No. 1		**3,105**	
Class No. 2—Any Other Light Breed (Minorcas)—15 Birds Competing.			
Langmaid & Bettison, **Salisbury.**	358 359 360 361 362 363	6 1 7 5 — 7	 14 12
			26
V. F. Gameau, **71, Findon Road,** **Woodville.**	364 365 366 367 368 369	5 12 16 — 3 2	 33 5
			38
R. M. Yelland, **Cunliffe.**	370 371 372	— — 2	
		2	
Total Class No. 2.			**66**
Class 3—Black Orpingtons—45 Birds Competing.			
A. G. Dawes, **Portrush Road,** **Glenunga.**	373 374 375 376 377 378	16 15 9 — 5 10	 40 15
			55
Willow Bend Stud **Poultry Farm,** **North Walkerville.**	379 380 381 382 383 384	20 8 7 22 16 20	 35 58
			93
H. J. Mills, **108, Edward Street,** **Edwardstown.**	385 386 387 388 389 390	1 6 4 — — 2	 11 2
			18
K. Pennack, **Pooraka.**	391 392 393 394 395 396	7 9 1 6 14 18	 17 38
			55

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
	397	9	
	398	15	
	399	7	31
H. H. Gallagher,	400	5	
Pooraka.	401	2	
	402	14	21
			52
	403	14	
V. E. Williams,	404	6	
57, Fairford Terrace,	405	4	
Semaphore Park.	405		
		24	
	406	16	
J. H. Dowling,	407	—	
Glossop.	408	5	
		21	
	409	3	
A. P. Urlwin,	410	—	
Box 80,	411		
Balaklava		3	
	412	13	
J. Rawe,	413	5	
Seaton Park.	414	5	
		23	
	415	7	
Raymoor Poultry Farm,	416	—	
William Street,	417	6	
Kilkenny.		13	
Total Class No. 3.		352	

Class No. 4—Any Other Heavy Breed—36 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
	418	—	
	419	12	
A. G Dawes,	420	—	12
Portrush Road,	421	17	
Glenunga.	422	16	
(Rhode Island Reds)	423	5	38
			50
	424	16	
	425	17	
Willow Bend Stud	426	13	46
Poultry Farm	427	4	
North Walkerville.	428	9	
(Rhode Island Reds.)	429	20	33
			79
	430	—	
	431	—	
V. F. Gameau,	432	—	—
71, Findon Road,	433	—	
Woodville.	434	1	
(Rhode Island Reds.)	435	—	1
			1
	436	14	
	437	17	
K. Pennack,	438	14	45
Pooraka	439	16	
(Barnevelders.)	440	3	
	441	18	37
			82
	442	2	
Raymoor Poultry Farm,	443	1	
William Street,	444	14	
Kilkenny.			
(Rhode Island Reds.)		17	
	445		
Eric F. Snow,	446	4	
18, Mt. Barker Road,	447	12	
Glen Osmond.			
(Rhode Island Reds.)		16	
Total Class No. 4.		245	

SECTION 2—DRY MASH.

Class No. 5—White Leghorns—15 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
	448	18	
	449	19	
	450	17	54
Arthur O. Dawkins,	451	17	
"Warrenbayne",	452	15	
Gawler.	453	14	46
			100
	454	22	
	455	17	
	456	18	57
Willow Bend Stud	457	19	
Poultry Farm,	458	9	
North Walkerville	459	16	44
			101
	460	4	
A. J. Monkhouse,	461	-	
Woodside.	462	14	
		18	
Total Class No. 5.		219	

Class No. 7—Black Orpingtons—6 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
	463	11	
	464	7	
Willow Bend Stud	465	—	18
Poultry Farm,	466	10	
North Walkerville.	467	18	
	468	18	46
			64
Total Class No. 7			64

Class No. 8—Rhode Island Reds 6 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.	
	469	11	
	470	24	
Willow Bend Stud	471	18	53
Poultry Farm,	472	20	
North Walkerville.	473	18	
	474	19	57
			110
Total Class No. 8			110

EGG-LAYING COMPETITION—*continued.*

SECTION 3—WET MASH.

Class No. 9.—Any Breed—27 Birds Competing.
(Home Project Utility Section).

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 28th April, 1936.
Peter Western, Ascot Park School. (White Leghorn.)	475	9
Peter Western, Ascot Park School. (White Leghorn.)	476	7
Stanley Pratt, Abattoirs School. (White Leghorn.)	477	6
Anthony Rix, Williamstown. (White Leghorn.)	478	16
John Short, Hamley Bridge School. (White Leghorn.)	479	20
Marion Brooks, Sandy Creek School. (White Leghorn.)	480	—
Owen Robinson, Ascot Park School. (White Leghorn.)	481	10
Eric Sincock, 138, Anzac Highway, Grassmere. (White Leghorn).	482	4
Reg W. Andrew, 61, South Road, Black Forest. (White Leghorn.)	483	11
Robert Fulton, 11, Glengarry Avenue, Glandore. (White Leghorn.)	484	2
Ray Couche, Thebarton School. (White Leghorn.)	485	13
Warren Hannaford, Paracombe School. (White Leghorn.)	486	10
Herbert Gwynne, Gawler School. (White Leghorn.)	487	12
Robert H. King, Tarlee School. (White Leghorn.)	488	7
Stanley W. Pethick, Ascot Park School. (White Leghorn.)	489	9
William Horne, Woodville High School. (White Leghorn.)	490	8
Bernice Jennings Mylor School. (White Leghorn.)	491	11
Ross. W. Schulz, Willunga School. (White Leghorn.)	492	1
Gordon Heard, Camden School. (White Leghorn.)	493	7
Laurel White, Williamstown School. (Black Orpington.)	494	9
David Hart, Unley High School. (Black Orpington.)	495	22
Bob Sweetland, Thebarton School. (Black Orpington.)	496	—
Malcolm Booth, Bridgewater School. (Black Orpington.)	497	—
Keith Oliver, McLaren Vale School. (Black Orpington.)	498	13
Colin Kies, Sandy Creek School. (Minorca.)	499	3
Alan Yelland, Cunliffe. (White Leghorn.)	500	13
Kenneth Ekers, Mt. Compass. (Black Orpington.)	501	23
Total Class No. 9		246

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1936-37, CONDUCTED AT PARAFIELD POULTRY STATION.

LEADING SCORES TO WEEK ENDED 28th APRIL, 1936.—*FIRST GRADE EGGS ONLY.*

SECTION I.—WET MASH.

Class 1.—White Leghorns.

(351 birds competing.)

Singles—	Eggs Laid.	Bird Nos.
A. O. Dawkins	20	90
E. McKee	20	161
A. O. Dawkins	19	85
E. McKee	19	160

Class 1.—*White Leghorns*—continued.

	Eggs Laid.	Bird Nos.
Trios—		
E. McKee	52	160–162
A. O. Dawkins	51	85–87
Teams—		
A. O. Dawkins	95	85–90
E. McKee	87	157–162
Willow Bend Stud Poultry Farm	81	295–300

Class 2—*Any Other Light Breed.*

(Minorcas—15 birds competing.)

	Eggs Laid.	Bird Nos.
Singles—		
V. F. Gameau	16	366
V. F. Gameau	12	365
Trios—		
V. F. Gameau	33	364–366
Langmaid and Bettison	14	358–360
Teams—		
V. F. Gameau	38	364–369
Langmaid and Bettison	26	358–363

Class 3.—*Black Orpingtons.*

(45 birds competing.)

	Eggs Laid.	Bird Nos.
Singles—		
Willow Bend Stud Poultry Farm	22	382
Willow Bend Stud Poultry Farm	20	384
Willow Bend Stud Poultry Farm	20	379
Trios—		
Willow Bend Stud Poultry Farm	58	382–384
A. G. Dawes	40	373–375

Class 4.—*Any Other Heavy Breed.*

(36 birds competing.)

	Eggs Laid.	Bird Nos.
Single—		
Willow Bend Stud Poultry Farm (Rhode Island Reds)	20	429
K. Pennack (Barnevelders)	18	441
Trios—		
Willow Bend Stud Poultry Farm (Rhode Island Reds)	46	424–426
K. Pennack (Barnevelders)	45	436–438
Teams—		
K. Pennack (Barnevelders)	82	436–441
Willow Bend Stud Poultry Farm (Rhode Island Reds)	79	424–429

SECTION II.—DRY MASH.

Class 5.—*White Leghorns.*

(15 birds competing.)

	Eggs Laid.	Bird Nos.
Singles—		
Willow Bend Stud Poultry Farm	22	454
A. O. Dawkins	19	449
Willow Bend Stud Poultry Farm	19	457
Trios—		
Willow Bend Stud Poultry Farm	57	454–456
A. O. Dawkins	54	448–450
Teams—		
Willow Bend Stud Poultry Farm	101	454–459
A. O. Dawkins	100	448–453

Class 7.—Black Orpingtons.

(6 birds competing.)

Singles—	Eggs Laid.	Bird Nos.
Willow Bend Stud Poultry Farm	18	467
Willow Bend Stud Poultry Farm	18	468

Class 8.—Rhode Islands Reds.

(6 birds competing.)

Single—		
Willow Bend Stud Poultry Farm	24	470
Willow Bend Stud Poultry Farm	20	472

SECTION III.—WET MASH.

Class 9.—Any Breed (Home Project Utility Section).

(27 birds competing.)

Name.	School.	Breed.	Eggs Laid.	Bird Nos.
Kenneth Ekers,	Mount Compass	(Black Orpington)	23	501
David Hart,	Unley High	(Black Orpington)	22	495
John Short,	Hamley Bridge	(White Leghorn)	20	479
Anthony Rix,	Williamstown	(White Leghorn)	16	478

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April, 1935; to 30th April, 1936.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal, 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 31st March, 1936.	No. Eggs Laid Month of April, 1936.	Total Eggs Laid 1st April, 1935, to 30th April, 1936.
No. 1 Test	7,450	248	7,698
No. 2 Test	7,569	316	7,885
No. 3 Test	8,130	379	8,509
No. 4 Test	6,659	254	6,913
No. 5 Test	6,763	331	7,094

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on 28th April, there being present:—Hon. A. L. McEwin, M.L.C. (Chairman), Messrs. J. W. Sandford, S. Shepherd, J. B. Murdoch, A. J. Cooke, F. Coleman, H. N. Wicks, P. J. Baily, Professor A. J. Perkins (Director of Agriculture), and H. C. Pritchard (Secretary).

Apologies were received from Messrs. A. M. Dawkins, G. Jeffrey, and Dr. Richardson.

Congress, 1936.—The Secretary was instructed to seek approval for the holding of the 1936 Congress. The Chairman, Vice-Chairman, Messrs. A. J. Cooke, H. N. Wicks, and the Secretary were appointed as a Committee to supervise arrangements.

Approval was given for the formation of Branches at *Cambrai* and *Owen* (*Women's*) and the re-organisation of the *Meadows* Branch, with the following as foundation members:—Cambrai—R. Miller, R. Hutton, D. H. Hutton, R. L. Hutton, K. Royal, L. Royal, D. Brophy, K. Brophy, F. W. McGorman, J. Starick, R. H. Pietsch, B. H. Braunach, H. Liersch, L. Haydon, A. T. Schultz, C. Schultz, E. H. Schirmer, G. B. Payne, B. H. Mickan, J. Baker, H. Mickan, F. W. Fiegert, H. F. Stevens; Meadows—G. Joyce, A. K. Surridge, L. A. King, E. Portlock, E. G. Mitchell, J. Turner, J. J. Teague, J. F. Smith, G. W. Bignell, F. J. Buck, H. C. Stacy, H. G. Egarr, W. C. Sickert, R. Bartley, C. R. Wharton, E. W. Young, J. F. E. Bensch, F. W. Gage, J. J. Devlin, J. M. Lawton, R. J. Underdown, J. J. Lomman; Owen Women's—Mrs. W. J. Marshman, Mrs. O. E. Hancock, Mrs. H. Moeller, Mrs. J. I. Williams, Mrs. E. S. Hancock, Mrs. H. Bradley, Miss M. Lake, Miss D. Jeffrey, Mrs. H. Helps, Miss G. Hancock, Miss D. McFarlane, Miss M. Helps, Miss D. Moeller, Mrs. T. L. Dunstan.

In the case of the Meadows Branch, the Secretary reported that this Branch had applied for an exemption from payment of *Journal* subscription fees, as had been granted other similar settlements in the Hills districts. This was agreed to, and the Secretary was instructed to ask the exemption for a period of 12 months.

Branches to be Closed.—The Board decided to close the North Booborowie, North Bundaleer, and Naracoorte Branches.

New Members.—The following names were added to the rolls of existing Branches:—Allandale East—A. W. Earl, Wm. L. Laslett, Gordon Thompson; Arthurton—H. J. Cadd, Ross Henderson; Balhannah—K. Robinson, W. Prosser, T. E. Grivell, J. Morris; Beetaloo Valley—Hurtle Sanders, Clem Giddings; Carey's Gully—S. Horsnell; Frayville—B. O. Kubenk; Green Patch—Colin Stephens, Geoffrey Pope, John Pope; Hilltown—Stan Sawley; Longwood—J. C. Dunstan; Maltee—Leslie Higgins; Mount Barker—T. G. Symonds, A. C. Hinton, J. F. White; Narridy Women's—Mrs. R. Smart; Nelshaby Women's—Mrs. L. E. Neagle; Penola—R. R. Rymill, Alan McDonald, E. Walsh, N. J. McBain, G. Clifford, M. Ricketts, M. Kidman; Petina—L. C. Kaehne; Pinnaroo Women's—Mrs. Teschendorf; Shoal Bay—Ronald Schaefer; Strathalbyn Women's—Mrs. A. Garbutt, Mrs. J. Stanton; Sutherlands—L. O. Worrall; Tantanoola Women's—Mrs. A. Jordan, Mrs. J. Kennedy; Tatiara—E. J. Buckley; Ungarra—A. R. Butler, F. C. Telfer; Watervale—Rex Glaetzer; Yandiah—Douglas Stirling, E. C. Michael, R. Llewelyn.

Retirement of Professor Perkins.—The Chairman, in informing members that this was the last meeting which Professor Perkins would attend as an official member of the Board, made reference to the long and active association that the Director had had with the Board, and with the agricultural activities of the State. The Director took with him the best wishes of the Board, and the appreciation of members of the services that he had rendered to the primary producers of the State. Each member present also spoke.

On the suggestion of Mr. Baily, it was decided that the Minister should be asked to recognise the Director's work by appointing him a life member of the Board.

Recognition of the Director's Services by Agricultural Bureaux.—The Secretary read a letter from the Sandalwood Branch of the Agricultural Bureau, suggesting that some action should be taken by Branches of the Agricultural Bureau to show their appreciation of the services rendered to the primary producers of the State by the Director. The Secretary was instructed to take preliminary steps to give effect to the suggestion of the Sandalwood Branch, and, when communicating with Branches, to ask for suggestions as to what form any presentation that might be made should take. A letter of appreciation of the work of Professor Perkins from the Inman Valley Branch was also read, and the Secretary was instructed to forward it to Professor Perkins.

Several items were taken in Committee.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co. Limited, reported on 1st May, 1936:—

Butter.—Production during April was very disappointing as, except for a light to moderate rain received in some parts, the month was fairly dry. The feed which had germinated was badly needing additional rains and until the pastures are more forward there can be little improvement expected in butter production. Throughout the month there was a shortage of choicest grade so that it was necessary to obtain consignments from the eastern States to augment supplies. The London market showed some improvement at the latter end and the rate at present is 87s. per cwt., and local values are:—Choicest creamery fresh butter, in bulk, 1s. 4¼d. per lb.; prints and delivery extra. (This price is for local sale only, and under the quota system, the equalised price manufacturers will receive will be 1s. 0¾d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines from 1s. to 1s. 1d. per lb. for choicest; stores, 8d. to 9d. per lb. (These prices are subject to equalisation levies.)

Cheese.—In the Mount Gambier districts conditions have been drier than for 70 years past, and consequently, the tonnage turned out has fallen back considerably. However, there was enough available for local and Westralian trade, although exporting overseas has now ceased. Values were without change, being:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. to 1s. 1d. per lb.

Eggs.—As is usual in the cold weather the supplies of eggs have declined, and as there was a strong demand maintained, values firmed throughout the month. Rates in the eastern States were much firmer and this also had an influence on the local market. Present values are:—Ordinary country eggs, fair average quality, from 1s. per dozen net; selected new laid clean eggs, full-sized, to 1s. 5d. per dozen net.

Bacon.—As the supplies of live hogs kept up well, curers were able to supply the markets with ample quantities of bacon from week to week. There was a hardening in rates but this did not affect the sale, and turnover was well maintained. Hams, however, have been difficult to quit owing to the heavy surplus stocks offering. Values are:—Best quality sides, 10d. per lb.; middles, 10d. to 10½d.; heavy middles, 9d.; rolls, to 8½d.; hams, 11d. to 1s.; cooked, 1s. 2d. to 1s. 2½d. per lb.; lard, bulk, 6d. to 6½d.; prints, 7½d. per lb.

Almonds.—Trading in most lines was well maintained, although at the end of the month the interstate inquiries were disappointing and a lull in sales was recorded. This was expected to be only temporary, however, and, therefore, rates were unchanged. Kernels, however, were in good request and sold readily at quotations:—Softshells and Brandis, 8½d. to 9d.; hardshells, 5d. to 5½d.; kernels, 1s. 9½d. to 1s. 10½d. per lb.

Honey.—With the setting in of colder weather the sale of honey showed a little improvement, but stocks were not materially reduced and some outside overseas markets are urgently needed to reduce the surplus. Rates are:—Prime quality clear extracted, 2d. to 2½d.; lower grades, 1d. to 2d. per lb.

Beeswax.—Was in moderate supply, but much heavier quantities could have been placed. We advise consigning. Quotations are:—1s. 2d. to 1s. 2½d. per lb., according to quality.

Live Poultry.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms. The quantities handled in our sale rooms this month were heavy, but there was a large attendance of buyers at each of the auctions, and all classes of birds submitted readliy changed hands. We could dispose of greater quantities, and have special facilities for displaying the birds for buyers' inspection. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. to 4s.; nice conditioned cockerels, 2s. 4d. to 2s. 10d.; fair conditioned, 1s. 8d. to 2s. 2d.; chickens, lower; heavy-weight hens, 2s. to 3s.; medium hens, 1s. 7d. to 1s. 11d.; light hens, 1s. 2d. to 1s. 6d.; couple of pens of weedy sorts, lower; prime young Muscovy drakes, 3s. to 3s. 9d.; young Muscovy ducks, 1s. 8d. to 2s. 3d.; ordinary ducks, 1s. to 1s. 9d.; ducklings, lower; geese, 2s. 8d. to 3s.; goslings, lower; turkeys, good to prime condition, 8½d. to 10d. per lb. live weight; turkeys, fair condition, 7d. to 8d. per lb. live weight; turkeys, poor and crooked breasted, lower; pigeons, 3d. to 5d. each.

Potatoes.—New season's, 9s. 6d. per cwt.

Onions.—Brown Spanish, 11s. per cwt.

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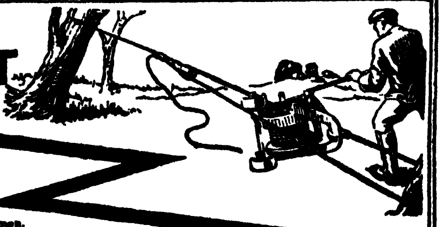

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RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of April, 1936, and also the average precipitation for March, and the average annual rainfall.

Station.	April, 1936.	Av'ge. for April.	To end April, 1936.	Av'ge. Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	—	0·22	1·43	4·62
Marree	—	0·38	0·71	5·83
Farina	—	0·44	0·81	6·37
Copley	—	0·56	1·31	7·85
Beltana	—	0·54	2·07	8·47
Blinman	—	0·80	2·01	11·81
Hookina	—	0·65	2·80	11·18
Hawker	0·07	0·88	1·97	12·2
Wilson	0·21	0·84	3·68	11·77
Gordon	0·34	0·50	2·20	10·46
Quorn	0·31	0·89	2·21	13·15
Port Augusta	0·09	0·76	3·03	9·40
Bruce	0·67	0·48	5·48	9·74
Hammond	0·37	0·83	3·40	11·11
Wilmington	2·02	1·33	5·19	17·28
Willowie	0·33	0·72	3·00	12·22
Melrose	2·38	1·62	5·42	22·85
Booleroo Centre	0·73	1·14	2·86	15·21
Port Germein	1·19	1·10	3·30	12·53
Wirrabara	1·54	1·43	2·80	19·25
Appila	0·72	1·14	3·22	14·62
Cradock	0·27	0·72	2·13	10·78
Carrieton	0·59	0·77	3·01	12·19
Johnburg	0·28	0·64	3·05	10·56
Eurelia	0·31	0·83	3·64	12·76
Orroroo	0·73	0·91	3·74	13·20
Nackara	0·33	0·58	8·73	11·09
Black Rock	0·38	0·85	4·19	12·35
Oodlawirra	0·51	0·69	4·34	11·67
Peterborough	0·63	0·92	3·96	13·22
Yongala	0·82	1·03	4·94	14·43
NORTH-EAST				
Yunta	0·03	0·56	1·98	8·84
Waukaringa	—	0·51	2·14	7·89
Mannahill	—	0·54	1·25	8·16
Cockburn	—	0·60	2·22	7·91
Broken Hill	0·02	0·71	2·10	9 50
LOWER NORTH.				
Port Pirie	0·44	1·16	4·61	13·19
Port Broughton	0·62	1·17	2·41	13·85
Bute	0·50	1·24	3·83	15·39
Laura	0·90	1·47	4·54	17·97
Caltowie	0·79	1·26	3·56	16·76
Jamestown	1·07	1·24	4·14	17·72
Gladstone	1·02	1·34	3·08	16·32
Crystal Brook	0·98	1·22	3·93	15·76
Georgetown	1·87	1·49	4·03	18·29
Narridy	1·01	1·24	2·50	15·77
Redhill	0·58	1·32	4·73	16·54
Spalding	1·19	0·98	3·65	18·74
Gulnare	1·54	1·08	3·76	18·59
Yacka	1·10	1·17	2·75	15·38
Koolunga	0·86	1·15	2·46	15·32
Snowtown	0·76	1·26	4·56	15·70
LOWER NORTH—*continued.*				
Brinkworth	1·16	0·88	2·44	15·73
Blyth	1·65	1·32	3·82	16·73
Clare	2·25	1·94	5·95	24·45
Mintaro	1·71	1·54	4·45	23·36
Watervale	2·29	2·20	5·63	26·74
Auburn	1·70	1·81	5·51	23·96
Hoyleton	1·51	1·46	4·03	17·27
Balaklava	1·16	1·38	2·57	15·43
Port Wakefield	0·74	1·12	3·68	12·93
Terowie	0·69	0·88	5·80	13·34
Whyte-Yarcowie	0·56	0·94	6·84	13·58
Hallett	0·93	1·12	4·51	16·41
Mount Bryan	1·32	0·93	5·29	16·77
Kooringa	1·34	1·20	4·78	17·81
Farrell's Flat	1·17	1·40	5·60	18·54
WEST OF MURRAY RANGE.				
Manoora	1·07	1·31	3·46	18·94
Saddleworth	1·27	1·63	5·02	19·59
Marrabel	1·72	1·60	4·56	19·96
Riverton	1·67	1·72	4·60	20·79
Tarlee	1·43	1·49	4·09	18·09
Stockport	1·28	1·32	4·04	16·97
Hamley Bridge	1·24	1·34	3·89	16·52
Kapunda	0·91	1·58	4·63	19·76
Freeling	0·88	1·39	2·92	17·79
Greenock	1·30	1·62	4·10	21·47
Truro	0·88	1·49	4·54	19·79
Stockwell	0·84	1·56	4·13	20·04
Nuriootpa	1·44	1·56	4·96	20·68
Angaston	1·40	1·66	5·36	22·32
Tanunda	1·54	1·70	4·42	21·94
Lyndoch	1·64	1·66	3·16	23·27
Williamstown	1·90	2·03	3·28	27·61
ADELAIDE PLAINS.				
Owen	1·64	1·17	3·82	14·64
Mallala	1·74	1·33	3·82	16·49
Roseworthy	1·29	1·40	2·84	17·42
Gawler	1·18	1·55	3·39	18·85
Two Wells	0·82	1·34	2·78	15·76
Virginia	1·50	1·37	3·85	17·20
Smithfield	1·34	1·10	2·90	17·65
Salisbury	1 17	1·55	2·13	18·56
Adelaide	1·21	1·73	3·39	21·14
Glen Osmond	1·44	2·01	3·77	25·97
Magill	1·45	1·94	3·26	25·37
MOUNT LOFTY RANGES.				
Teatree Gully	1·65	1·89	3·29	27·07
Stirling West	3·40	3·57	5·81	46·95
Uraidla	2·17	3·22	4·11	43·95
Clarendon	2·71	2·72	4·45	32·79
Happy Val'y Res.	1·95	—	3·71	—
Morphett Vale	1·53	1·81	2·84	22·59
Noarlunga	1·83	1·63	3·62	20·33
Willunga	1·02	1·49	2·23	25·97
Aldinga	1·94	1·93	3·48	20·21

RAINFALL—*continued*.

Station.	April, 1936.	Av'ge. for April,	To end April, 1936.	Av'ge. Annual Rainfall.
MOUNT LOFTY RANGES—*continued*.				
Myponga	2·26	1·77	3·64	29·42
Inman Valley .	1·31	—	3·27	—
Yankalilla	1·05	1·63	2·59	22·76
Mount Compass	2·03	—	4·21	—
Mount Pleasant	1·62	1·99	5·63	27·11
Birdwood	1·87	2·03	4·15	29·07
Gumeracha ...	1·92	2·44	3·45	33·31
Millbrook Res..	2·10	1·77	3·70	34·47
Lobethal	2·02	2·53	4·31	35·91
Woodside	1·73	2·18	4·06	32·15
Hahudorf	2·21	2·45	3·71	34·77
Nairne	2·40	2·06	5·64	28·12
Mount Barker	2·36	2·23	4·97	31·24
Echunga	2·84	2·53	5·66	33·25
Macclesfield ..	2·77	2·27	6 73	30·34
Meadows	2 65	2·81	5·83	36·02
Strathalbyn ..	2·79	1·39	6·16	19·32
MURRAY FLATS AND VALLEY				
Meningie......	1·87	1·44	3·75	18·31
Milang	1·55	1·21	4·64	14·89
Langhorne's Ck	2·30	1·12	5·11	14·91
Wellington ...	1·34	1·17	4·48	14·65
Tailem Bend ..	1·38	0·78	5·38	15·06
Murray Bridge	1·53	1·09	4·59	13·51
Callington	1·84	1·09	4·25	15·15
Mannum	1·14	0·99	3·57	11·48
Palmer	1·19	0·89	4·59	15·59
Sedan	0·35	0·87	3·01	12·05
Swan Reach...	0·40	0·55	3·61	10·65
Blanchetown ..	0·44	1·02	4·41	11·01
Eudunda	0·96	1·32	5·09	17·15
Point Pass ...	1·22	0·99	5·17	16·72
Sutherlands ..	0·24	0·62	4·58	10·81
Morgan	0·25	0·62	2·94	9·16
Waikerie......	0·27	0·54	5·21	9·66
Overland Corner	0·22	0·75	4·40	10·25
Loxton	0·39	0·50	3·80	11·50
Berri	0·54	0·49	4·62	10·13
Renmark	0·50	0·63	5·35	10·38
WEST OF SPENCER'S GULF.				
Eucla	0 33	1 08	1·03	10·02
Nullarbor	0·09	0·63	0·75	8·85
Fowler's Bay .	0·30	0·85	0·52	11·19
Penong	0·39	0·83	0·92	12·22
Koonibba	0·45	0·69	1·11	12·09
Denial Bay ...	0·46	0·91	1·25	11·19
Ceduna	0·27	0·61	1·06	10·21
Smoky Bay ...	0·36	0·60	0·75	10·42
Wirrulla	0·26	0·59	1·16	10·51
Streaky Bay ..	0·38	0·97	0·56	14·85
Chandada	0·12	1·00	0·46	12·42
Minnipa	0·60	0·67	1·31	13·91
Kyancutta ...	0·24	1·00	1 56	12·77
Talia	0·26	0·63	0·40	14·76
Port Elliston .	0 37	1·07	0·53	16·51
Lock	0·33	0·78	2·41	16·34
Mount Hope ..	0·60	—	0·69	—
Yeelanna	0 59	0·87	0·87	15·94
Cummins	0·37	0·85	0·75	17·58
Port Lincoln..	0·92	1·43	1·93	19·37
Tumby	0·46	0·94	1·20	14·25
Ungarra	0·26	0·88	2·56	16·87
Port Neil	0·43	0·80	2·17	13·11

Station.	April, 1936.	Av'ge. for April,	To end April, 1936.	Av'ge. Annual Rainfall.
WEST OF SPENCERS GULF—*continued*.				
Arno Bay	0·50	0·94	1·97	12·71
Rudall	0·28	0·87	2·53	12·98
Cleve	0·51	1·13	3·48	14·88
Cowell	1·62	1·10	4·01	11·07
Miltalie	0·76	1·14	3·34	13·70
Mangalo	0·20	0·87	6·02	13·86
Darke's Peak ...	0·37	0·75	2·89	15·08
Kimba	0·24	0·74	1·37	11·68
YORKE PENINSULA.				
Wallaroo	0·75	1·25	3·35	13·97
Kadina	0·49	1·42	3·38	15·60
Moonta	0·65	1·43	2·56	15·06
Paskeville.......	0·54	1·22	6·72	15·47
Maitland........	0·94	1·68	2·39	19·85
Ardrossan.......	0·34	1·17	2·12	13·95
Port Victoria ...	0·65	1·30	1·46	15·41
Curramulka	0·73	1·26	1·89	17·81
Minlaton........	0·83	1·37	1·92	17·74
Port Vincent ...	0·75	0·88	2·05	14·38
Brentwood	0·41	1·09	1·02	15·54
Stansbury	0·41	1·28	1·92	16·81
Warooka	0·60	1·38	1·37	17·44
Yorketown	0·36	1·29	1·23	16·83
Edithburgh	0·57	1·34	1·56	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	2·00	1·86	3·61	24·80
Kingscote	0·75	1·42	1·80	19·16
Penneshaw	1·18	1·31	1·99	19·00
Victor Harbour .	1·22	1·63	3·42	21·40
Port Elliot	1·29	1·55	3·85	19·94
Goolwa	1·86	1·25	4·72	17·86
Maggea	0·35	0·74	5·18	10·20
Copeville	0·69	0·51	6·00	11·53
Claypans	0·91	0·54	4·92	10·42
Meribah	0·39	0·98	4·41	11·32
Alawoona	0·29	0·75	4·23	10·40
Caliph	0·44	1·02	3·82	10·98
Mindarie	0·42	0·58	4·20	12·23
Sandalwood	0·53	0·52	5·46	13·64
Karoonda	0·69	0·66	4·31	14·17
Pinnaroo	0·66	0·80	4·76	14·36
Parilla..........	0·80	0·81	4 10	13·72
Lameroo	0·78	1·03	3·87	15·87
Parrakie	0·75	0·72	3·75	14·56
Geranium	0·67	0·96	3·87	16·36
Peake	0·77	0 84	3·07	15·93
Cooke's Plains ..	0·88	1·11	5·27	15·28
Coomandook	0·82	1·01	3·86	17·03
Coonalpyn	1·07	1·36	3·26	17·61
Tintinara	1·03	1·33	2·87	18·62
Keith	1·26	1·14	3·19	17·93
Bordertown	0·47	1·55	2·74	19·14
Wolseley........	0·43	1·53	2·40	18·47
Frances.........	0·61	1·45	2·51	20·08
Naracoorte	0·87	1·75	2·49	22·63
Penola	1·09	1·87	2·13	25·96
Lucindale	1·30	1·84	4·37	23·38
Kingston	1·20	1·84	3·13	24·24
Robe	1·33	1·77	2·87	24·64
Beachport	1·14	1·93	2·86	27·06
Millicent	1·67	2·37	4·28	29·83
Kalangadoo	1·64	2·14	3·25	32·20
Mount Gambier..	1·66	2·34	3·19	30·87

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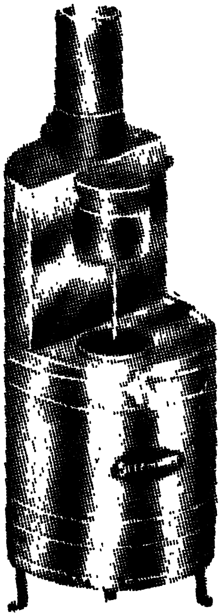

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AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
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Angaston	*	—	—
Appila-Yarrowie	1265	5	3
Arthurton	*	—	—
Ashbourne	*	3	1
Auburn Women's	*	—	—
Balaklava	*	22	27
Balhannah	*	—	—
Balhannah Women's	1286	—	—
Balumbah	*	—	—
Balumbah Women's	1279	8	1
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Karte Women's	*	3	8
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Koonunga	*	—	—
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Milang	*	6	4
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Monarto South Women's	*	20	18
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Moorook	*	—	—
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Mount Bryan	*	—	—
Mount Compass	*	4	—
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Murraytown	*	—	—
Mypolonga	*	—	—
Myponga	*	18	16
Myponga Women's	1280	11	9
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Narridy Women's	*	—	—
Narrung	*	—	—
Nelshaby	*	—	—
Nelshaby Women's	*	—	—
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Nunkeri	*	4	2
O'Loughlin	*	8	13
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Owen	*	8	13
Owen Women's	*	11	9
Palabie	*	—	—
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Parilla Women's	*	17	15
Parilla Well	*	8	6
Parilla Well Women's	*	30	28
Parrakie	*	—	—
Parrakie Women's	1280	24	22
Paruna	1266	—	—
Paskeville	*	2 & 30	—
Penola	1265	6	4
Penola Women's	1279	—	—
Penwortham	*	3	1
Petina	*	27	25
Pinbong	1266	27	25
Pinbong Women's	1280	27	25
Pinkawillinnie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	1280	5	3
Port Elliot	*	—	—
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Pygery Women's	*	9	7
Ramco	*	1 & 29	—
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Branch.	Report on Page.	Dates of Meetings.	
		June	July
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Truro	1265	15	20
Ungarra	1266	—	—
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Waikerie	*	—	—
Wallala	1266	13	11
Wandearah	1265	2	7
Warcowie	1265	2 & 30	—
Warcowie Women's	1280	—	—
Warramboo	1266	2 & 30	—
Warramboo Women's	1280	—	—
Wasleys	1265	4	2
Wasleys Women's	1280	4	2
Watervale	*	15	20
Weavers	1266	8	13
Wepowie	*	1 & 29	—
Wepowie Women's	*	—	—
Whitwarta	*	15	20
Wilkawatt Women's	*	16	21
Williamstown	*	—	—
Williamstown Women's	*	3	1
Willowie	*	22	27
Wilmington	1265	16	21
Wilmington Women's	1280	11	9
Wirrabara	*	—	—
Wirrabara Women's	*	18	16
Wirrilla	*	6	4
Wirrilla Women's	*	4	2
Wolseley	*	13	11
Wudinna	*	—	—
Yadnarie	*	2 & 30	—
Yandiah	*	12	10
Yandiah Women's	1280	12	10
Yeelanna	1266	3	1
Younghusband	*	—	—
Yundi	*	—	—
Yurgo	*	—	—
Yurgo Women's	*	—	—

* No report received during the month of April. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from 1st August, 1934, with the following exceptions:—Life members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

Services of Geologist.—The Director of Mines has intimated that it has been decided by the Government that, in future, a charge of £2 2s. must be made for the services of a geologist who selects sites for wells or boreholes on small holdings, and that a larger fee must be charged where larger areas are examined geologically for this purpose.

MEN'S BRANCHES.

WHEAT VARIETIES SUITABLE FOR THE TATIARA DISTRICT.

[Address given by Mr. E. S. Alcock, R.D.A., Agricultural Instructor for the South-East, before the Wolseley Branch of the Agricultural Bureau.]

A perusal of the list of varieties in Australia shows that varieties which are grown to any extent are those which have been raised in the Commonwealth. Wheats which have been introduced from time to time have been used for cross-breeding, and the results of the work of the respective Departments of Agriculture are being carefully watched by progressive growers in the various States in order to give a trial to any promising varieties. According to the Government Statist, nearly 200 varieties of wheats are grown in South Australia, and it might be said that many of these could be discarded on account of yield. The number of varieties grown in the Tatiara district is not, however, very large, but nevertheless, the total production of the district would be improved by the more general use of more suitable wheats.

Improvement in Quality.

Much dissatisfaction has been lately heard in regard to the quality of Australian flour, and although the grower might state that this is the concern of the miller, there is another aspect to be considered. If the primary products of Australia are to be placed on the world's markets, they must be such that will find a ready sale. If the goods offered to a buyer are what he wants, he will pay the seller's price, but if the seller offers him something which is not up to the standard of his requirements, the buyer takes it at his own price. Experience has shown that those varieties of wheat which produced strong flour were poor yielders, and were, therefore, not favoured by wheatgrowers. The Wheat Improvement Committee in South Australia has recommended the following varieties for general planting in this State:—Aussie, Canberra, Crossbred 53, Currawa, Dundee, Federation, Felix Ford, Gluyas, Late Gluyas, Minister, Quality, Ranee, Sword, and Nabawa. The Committee has strongly urged that the following varieties should no longer be grown:—Free Gallipoli, Gluclub, Waratah, and Ghurka.

In 1925, Federation represented 75 per cent. of the total wheat sown in Victoria, Huff's Imperial 8 per cent., Penny and Major 4 per cent., Dollar and Wannon 2 per cent. In 1934 Free Gallipoli had displaced Federation and represented 57 per cent. of the wheats in Victoria, Ghurka 21 per cent., Ranee 9 per cent., Nizam 3 per cent., Federation and Wannon 2 per cent. In South Australia Free Gallipoli held third position in the list of the most popular varieties. During the seasons 1932, 1933, and 1934, 300,000 to 400,000 acres were sown to this variety. In New South Wales it was the fifth most popular wheat in 1934 and eleventh in Western Australia. It was claimed that Gallipoli increased the yield by 2bush. per acre. This variety would still have been the most popular in this district had not a ban been placed on it on account of its poor baking qualities. At Salisbury (Victoria) where the soil conditions and climate are somewhat similar to those in the Tatiara district, the undermentioned varieties gave the following results for four seasons (1931-1934):—Ghurka (39bush.), Gallipoli (35.3), Mogul (34.6), Rajah (34.6), Nizam (33), Ranee 4H (32.5), Federation (30.4). Mr. J. Brake (Agricultural Superintendent), speaking at a Field Day recommended Ranee 4H which, he said, had done well in Departmental tests in Victoria.

In another series of trials over four years, earlier than the above, the results were as follows:—Gallipoli (28.1), Rajah (29.1), Ranee 4H (26.7), Mogul (27.1), Federation (24.9).

Wheat varieties have been sown on Mr. W. Gill's property at Keith, and the results (1928-1932) were—Bena (20bush. 43lbs.), Sultan (18bush. 52lbs.), Dan (16bush. 46lbs.), Federation (16bush. 37lbs.), Major (16bush. 24lbs.); and for 1930-33—Federation (15bush. 37lbs.), Gallipoli (19bush. 25lbs.). From these figures, Bena, Gallipoli, and Sultan show the best results for this locality. Whilst on the heavier land Ghurka and Gallipoli, followed by several varieties which have never been popular in this district, except Nizam and Ranee 4H.

VARIETIES WORTH CONSIDERING.

Since Federation yielded so well in this district, it is desirable to look at those varieties which have Federation strain in them. The main reason why these Federation strains are so popular here is because they are short-strawed and do not grow rank like so many other varieties are inclined to grow on heavy land.

Federation was bred by crossing Purple Straw with Yandilla King, Ranee (Federation x Indian F), Dundee (Hard Federation x Cleveland) x Sands, Union (Federation x Nullah), Duchess (Federation x Minister), Ghurka (Indian H x Federation x Currawa), Gallipoli (Club x Yandilla King), Nizam (Indian F x Federation), Mogul (Indian F x Telford's), Rajah (Indian F x Telford's), Bena (Hard Federation x Marshall's), Sultan (King's White x Caliph), Dan (Daphne x Fan), Major (Federation x Wallace).

Ranee 4H.—This variety is increasing in popularity. It was the fourth most popular in 1932 and has been second in the list for the last three years and for 1934-35; 14.31 per cent. of the total area sown in this State was Ranee (495,175 acres). In other States it is increasing, and in New South Wales it is said to be displacing Nabawa. It is, however, subject to rust and Flag Smut.

Dundee.—A New South Wales bred wheat which is now on trial. It grows a medium height, with strong straw, holding its grain well, and stands up better than Gallipoli. Gluten quality is good. Resistant to Flag Smut but subject to rust. It is worthy of a fair trial in this district because it is reported to do well where Federation is popular.

Duchess.—Said to be of medium height wheat, producing excellent grain of good milling quality, but owing to straw weakness and liability to disease, despite holding its grain well and also yielding well in favourable seasons, this variety is not likely to be very popular.

Ghurka.—A Victorian variety which is gaining popularity on account of high yielding ability in that State. It yields well and resists disease very well, but is not recommended for general sowing in this State on account of its low flour strength.

Nizam.—This dark-chaffed club-tipped variety has been grown in this district and has yielded quite a lot of grain in favourable years, but as it is subject to rust and flag smut, is not likely to be largely grown.

Mogul and Rajah.—These two Victorian varieties claim the same parents, but are quite different in appearance. Neither have very much to recommend them.

Bena.—This variety was given a trial here some years ago, but it did not give sufficient promise and is not grown now. It is subject to both rust and Flag Smut.

Sultan.—This Roseworthy variety has not found favour in this district because of its tendency to lodge. It is much more suitable for the light mallee soils.

Dan.—This variety did well at Keith, and was also tried out at Millicent, but grew too tall.

Major.—This variety was grown here some years ago, but made too much growth of straw, but yielded well. It is now grown in the lower South-East, and yields well unless there is too much rust.

Bencubbin (Gluyas x Nabawa).—This variety was bred in Western Australia, where it is the most popular wheat. White chaffed and holds its grain well, and also has the power of crowding out weeds, but its weak straw and tall-growing habit will not make it very suitable for this district despite the good yields. It is now on trial in the district.

Baringa (Gullen x Bomen).—Raised in New South Wales. A white-chaffed wheat earlier ripening than Gallipoli, hard to thresh. Susceptible to rust. Has been very successful in New South Wales. A little has been sown, but does not seem to be favoured by many.

Baldmin.—Bred at Dookie, Victoria. A medium strong wheat, which has yielded well at Dookie. Rather weak in the straw and inclined to lodge. Has been tried, but not very successful here.

Ford (Fan x Comeback x Tardent's Blue x Zealand).—This Roseworthy College variety is very disease-resistant, especially to bunt. It is now well known and making great progress in New South Wales as well as outside the Commonwealth. When grown in this district, it grows rather tall, and being a white-chaffed wheat, is not as popular as some other varieties. Has been used by Roseworthy College to check the variations which occur in the different parts of the State regarding flour strength.

Sword.—Bred at Roseworthy. This variety was grown in the district after its good performance at Roseworthy, and in other parts of the State. It was inclined to grow too tall and did not yield as well as the more popular varieties in this locality.

Minister (Dart's Imperial x Fife-Indian x Dart's Imperial).—This variety was grown in the district some time ago, and yielded well with some growers. A bonus was paid by some millers for this grain. Susceptible to rust and Flag Smut.

Resistance to Disease.

This district does not suffer badly from disease, when compared with some other districts in this State, but those that have been noticed are as follows:—

Flag Smut.—This disease has appeared in small areas in several paddocks, and it is only occasionally that it makes a serious effect on the yield. The heavy rainfall must help to pack the soil and form a compact seedbed, thus helping to control this disease.

Take-all.—This disease like Flag Smut, does not take any serious proportions in this district, unless the seedbeds are exceptionally loose.

Loose Smut.—This is easily the worst disease in the district, and must be responsible for considerable reduction in the wheat yields annually. More care is needed in the selection of seed in order to reduce the severity of this disease. No easy method of prevention is available, as the spores of this fungus are located inside the grain. The only treatment for control is rather cumbersome for the farmer, because it is necessary to immerse the wheat in hot water for a considerable period and, at the same time, to keep the temperature fairly consistent or else the grain will not germinate.

Bunt or Stinking Smut.—This disease is so well known and well under control that it is seldom seen in the Tatiara district.

Rust.—This is a seasonable disease, but it does not do the damage to wheat crops as in the early days. Nevertheless, unless care is exercised in sowing only varieties that are not susceptible, the yields in some years will be greatly affected.

Eel Worms.—These small insects do quite a lot of damage to cereal crops in some soils, especially where the seedbed is left open and loose, and also in fields that have been over-cropped.

1936 CALENDAR 1936

JANUARY

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	●	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...

FEBRUARY

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	●	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

MARCH

S	M	T	W	T	F	S
1	2	3	4	5	6	7
●	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...

APRIL

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	●	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	...	...

MAY

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	●	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	1	2	3	4	●	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	...	...	...	...
...	...	...	...	...	...	...

JULY

S	M	T	W	T	F	S
...	...	...	1	2	3	4
●	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...
...	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	●	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
...	...	●	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	...	...	...

OCTOBER

S	M	T	W	T	F	S
...	...	...	...	●	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	●	31

NOVEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
●	30	...	...	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	●	29	30	31	...	...

● FULL MOON

SUMMARY.

Sow only varieties which are suitable for the district—those which have yielded well and are recommended from districts similar in climate and soil. Give some attention to quality as well as quantity, because buyers judge the produce on quality.

Varieties which might be worth trying:—Ranee 4H, Dundee, Union, Duchess, Dan, Baringa, Bencubbin, Sword, Minister, Nizam, Ford.

Give some consideration to the resistance of varieties to various diseases such as Flag Smut, Rust, and select seed free from Loose Smut.

BALHANNAH AGRICULTURAL BUREAU SHOW.

The second competitive show organised by the Balhannah Agricultural Bureau was held on Saturday, 28th March, and the increased number of entries and better quality were evidence of the interest aroused. Bureau members hope to enlarge the show into a full-sized agricultural event for the autumn, and already are looking for a show ground. The classes on this occasion were restricted to indoor sections, but in a few years the Balhannah event should be the equal of any of the Hills shows.

The show was opened by Mr. Playford, M.P., and Messrs. Morphett, M.P., and Young, M.L.C., also spoke. A vote of thanks was moved by Mr. H. N. Wicks (Advisory Board of Agriculture). Mr. E. W. Mattner supported him.

"The export apples were excellent, and if all those sent overseas were of equal quality there would be no complaints," said the judge (Mr. E. Leishman). "The pears and other apples were of outstanding quality, but competition was poor."

The vegetables were judged by Mr. Bert. Gore, of Piccadilly, who said that the standard was extremely high. Cabbages, cauliflowers, and carrots were outstanding, while the potatoes, onions and peas were particularly good.

Mr. W. Hughes, of Unley, judged the flowers, and was very favourably impressed by their quality. The roses were excellent for the time of the year, and he commented favourably on the other classes.

Mrs. I. Park judged the preserves, cookery, and needlework, which was generally of good quality, while she was particularly impressed with the jams and jellies.

CROP COMPETITIONS IN THE SOUTH-EAST.

PRESENTATION OF TROPHIES.

"My recent trip to New Zealand has more than ever convinced me of the almost unlimited agricultural and livestock possibilities of the South-East, and that with proper development the South-East will, in the future, support as many people as the whole of the other rural areas of South Australia—this future may not be as far distant as we think."

This statement was made by Mr. L. DeGaris (Mayor of Mount Gambier) in the course of an address on the occasion of the presentation of prizes awarded in the Mount Gambier Agricultural Bureau and Agricultural Society's Annual Crop Competitions in the local town hall on Thursday, 23rd April. Continuing, Mr. DeGaris said New Zealand exports amounted to approximately £50,000,000 each year, 91.4 per cent. of which was derived from her pastoral industry. Normally, every acre under cultivation returned £3 in exportable produce every year. He made reference to the valuable investigational work which was being carried out at the Kybybolite Experimental Farm. The Lincoln College at Christchurch comprised an area of 1,000 acres, and was supported by private endowments, Government subsidies, and donations from farmers and millers' associations. The farmers gave 1½d. per bushel on the whole of the crop they produced, and the millers subscribed a like amount on all wheat which passed through the mills. The scope of work of the College covered cereal breeding, stock raising, improving grasses. Although New Zealand grew only sufficient wheat to feed her own people, farmers received a guaranteed price of 4s. 4d. per bushel. The average wheat yield of New Zealand was 32bush. to the acre, 75 per cent. of the wheat being of the Tuscan variety. The object of the wheat-breeding experiments at the College was to evolve a wheat suitable to local conditions, and secondly, to produce a wheat with high milling qualities, at the same time maintaining the highest possible yields. This, said Mr. DeGaris, was one reason why the millers subscribed so willingly to the upkeep of the College. Speaking to Mr. Calder, who had charge of the grass and pasture experiments, the speaker had learned that the College advised a period of 6 months' fallow before laying down a paddock to pasture. South-Eastern graziers, Mr. DeGaris said, would have to pay more attention to the initial preparation of the land which was going to carry their grasses and clovers.

At the Massey College the South Australians had been particularly interested in the work which was being done in regard to hairiness in wool. This work involved the testing of every Romney Marsh stud flock in the Dominion. Mr. DeGaris believed that this was a field for research work in Australia which would pay for exploration. On being asked to make some reference to the lamb industry, the speaker said the fat lamb of New Zealand was practically a standardised form of produce. Practically all the lambs were by a Southdown ram from a Romney Marsh mother, and were remarkably even. The best lambs of the South-East, he believed, were better than those of New Zealand; the flavour of our lambs was definitely better. New Zealand's big advantage, however, was that something like 90 per cent. of their lambs were killed the same day that they were taken off their mothers.

Mr. L. J. Cook (Manager of the Kybybolite Experimental Farm) supported Mr. DeGaris in his remarks concerning the possibilities of the South-East. Pasture, he said, was the most important crop in the South-East. The district was using considerably more superphosphate than in the past, which was a good indication of the progress that was being made. Too many landowners, however, were prone to thing that top-dressing was the beginning and end of pasture management. There was a much bigger lesson to learn than that. The crowding of large numbers of stock on comparatively small areas had already brought in its wake diseases which they previously had not encountered. They need not, however, be unduly dismayed. Research work was already in hand, and was meeting with success.

Mr. DeGaris had referred to the production of £8 per acre from New Zealand pastures. There were many fields on the Kybybolite Farm that had carried 3 ewes and 3 lambs to the acre—the lambs being sold for 15s. and the wool from their mothers, 14s.—the returns per acre being in the vicinity of £4, and there were thousands of acres in the South-East now lying idle capable of giving those figures. He agreed with Mr. DeGaris that fallowing in preparation for laying down of a pasture would give best results.

Mr. DeGaris made the following presentations:—Barley Section—First prize, D. A. Norman; Second, A. H. Allen. Pastures—First, C. T. Major; Second, F. C. Caine. Oats—First, L. H. Patzell; Second, F. W. Button. Maize—First, J. T. Carthew; Second, J. Hyde. Messrs. S. Shepherd (Advisory Board of Agriculture) and F. C. Richards (Asst. Secretary, Agricultural Bureau) also addressed the meeting. An excellent programme was provided by Mrs. Reid's and Mr. Prime's orchestra, Miss McPherson, Mrs. A. Williams, and Miss E. Dodd. Mr. C. T. Major presided.

POTATO COMPETITION—MOUNT COMPASS SCHOOL BOYS.

[H. H. Orchard, Horticultural Instructor.]

For the fifth year a potato growing competition for boys attending the Mount Compass school was conducted by the local Branch of the Agricultural Bureau. Each boy receives 1lb. of seed, and, in the presence of stewards appointed by the Branch, cuts the tubers (this year 10 in number) into as many sets as he desires, and plants them as he thinks best. The allotment of seed, cutting and planting, and later on the digging of the crop are closely watched; other operations, such as the preparation of the land prior to planting, subsequent treatment, and the use of fertilisers are left to the discretion of the landowner. The prinicpal prize goes to the boy who digs the highest yield. This year Messrs. Pitt Bros., of Ashbourne, kindly donated selected Carmen seed of their own growing, and the results obtained by the boys must be very gratifying to the donors, who, in addition, presented the prizes for the competition.

Cutting and planting was done on 29th October, 1935, and the number of sets obtained from the 10 tubers supplied ranged from a minimum of 34 up to a maximum of 92, the average being 57. The plots were dug on 12th March, 1936, with the following results:—

Yields of Potato Competition, 1936, *Mount Compass School Boys.*

Competitor.	Sets Planted.	Sets Shot.	Sets Dug.	Yield. lbs.
Linton Jacobs	92	91	90	438
Don Jacobs	67	61	61	294
Ben Peters	40	40	40	281
Fred Dreyer	45	45	45	207½
Kelvin Peters	39	37	37	170
Douglas Chigwidden.. ..	89	85	85	152
Sam Miller..	37	37	32	139½
Laurie Garden	34	32	32	118½
Kevin Harris	63	63	63	95½
Harry Garden	35	33	33	78½
Brian Simons	85	60	30	63
Average	57	53	50	185¼

Average yield per set, 3.721lbs.

Altogether, 11lbs. of potatoes were planted, which yielded 2,037½lbs., or an average of 185¼lbs. of potatoes for every plot planted.

The previous record yield of 278lbs., established by Don McKinley in 1934, was easily broken this year by Linton Jacobs, and two other boys, Don Jacobs and Ben Peters, also exceeded the previous best.

Highest Yield from 1lb. of Seed Potatoes, Mount Compass School Boys.

Year.	Winner.	Yield. lbs.
1932	Kelvin Peters	108
1933	Linton Jacobs..	217
1934	Don McKinley	278
1935	Don McKinley	270
1936	Linton Jacobs	438

The average yield per set of the leading competitors is interesting, as the following table shows:—

Competitor.	Sets Dug.	Yield. lbs.	Average Weight per Set. lbs.
Linton Jacobs	90	438	4.87
Don Jacobs..	61	294	4.82
Ben Peters	40	281	7.00
Fred Dreyer	45	207½	4.61

The fertilisers used on the two leading plots comprised:—

	s.	d.
20lbs. blood and bone, estimated cost	1	6
20lbs. 48 super, estimated cost	0	10
10lbs. sulphate of ammonia, estimated cost	1	2
2 bags fowl manure	1	8
Total	5	2

The potatoes from these two plots were purchased by the donors of the seed at the ruling market price of 6s. per cwt., so that these two boys, for an outlay of 5s. 2d. for fertilisers, received 22s. and 18s. respectively.

When the foregoing figures are worked out on an acreage basis the following interesting results are obtained:—

Potato Competition, Mount Compass School Boys.

Competitor.	Area of Plot. sq. ft.	Yield. lbs.	Cost of Fertiliser per acre rate. £	s.	d.	Yield per acre rate. T.	c.	lbs.	Gross returns at £6 per ton. £	s.	d.
Linton Jacobs	480	438	23	5	0	17	14	100	106	10	0
Don Jacobs	441	294	25	10	4	12	19	97	77	15	9

The top growth, or growth of haulms, was remarkable in some of the plots, the heaviest amount from one set being 24lbs. on the prize-winning plot. The heaviest tuber was 3½lbs., dug by Sam Miller.

Most of the competitors dug good shaped, clean skinned tubers, with an absence of disease. At the local show, held two days after digging was completed, all the produce was exhibited, in accordance with the regulations governing the competition, and judged from a commercial point of view. This award finally went to Don Jacobs, after a close contest with Fred. Dreyer.

The two leading crops were grown in well-prepared black peat swamp land, and were watered three times with sprinklers during the season. The third crop was planted in a dark sandy loam, and was irrigated, and the fourth was in a heavy peat land, cropped for the first time after clearing.

Congratulations are extended to the boys on their splendid efforts, and to members of the Bureau, who have fostered an interesting competition for the boys.

POTATO GROWING—YUNDI SCHOOL BOYS.

[MR. H. H. ORCHARD (Horticultural Instructor).]

The Yundi Branch of the Agricultural Bureau conducted a potato growing competition for school boys along similar lines to the Mount Compass event, differing only in the allotment of the prizes. Chief prize went to the boy who obtained the highest yield of marketable potatoes, and other prizes were allotted to the second highest yield of marketable tubers and to the best sample.

The same seed as at Mount Compass, selected Carmens grown and donated by Messrs. Pitt Brothers of Ashbourne, was used. The results obtained are highly gratifying, especially when it is realised that two years ago the land was scrub.

Altogether 18 plots were planted but for various reasons the number was reduced to 12 at the time of digging and of this number, three could not be included because of extraneous circumstances greatly affecting the yields.

The winner proved to be Douglas Smith who planted and dug 67 sets and obtained 279lbs., representing 86.51 per cent. of the crop, of good, clean skinned, marketable potatoes. Sydney Guthridge was second with 214lbs., representing 77.25 per cent. of the crop, and Clyde Smith, an older brother of Douglas, a close third with 201lbs. with the good percentage of 86.27. The prize for the best sample was awarded to Harold Normandale. The following are the results:—

YIELDS OF POTATO COMPETITION, 1936, YUNDI SCHOOL BOYS.

Competitor.	Yield from 1lb. seed— Marketable.	Small and Inferior.
	Lbs.	Lbs.
Douglas Smith	279	43½
Sydney Guthridge	214	63
Clyde Smith	201	32
Harold Normandale	85	37
Douglas Marshall	62	23½
Ross McAlister	61½	45½
Keith Lomax	43½	22½
Max Sykes	34½	30
Frank Field	29½	45

The average number of sets planted per pound of seed was 60, and the average number dug 43.

Douglas Smith used bone-dust and fowl manure at an approximate cost of 3s. 10d.; Sydney Guthridge used blood and bone manure and fowl manure costing about 2s. 10d.; Clyde Smith used similar fertilizers at the same cost as his brother Douglas.

POTATO EXPERIMENTS AT CAREY'S GULLY.

At the April meeting of the Carey's Gully Branch the Chairman reported on the potato experimental plots carried out in his garden. Plots of one square rod were measured out on hill slope land typical of the district. Ordinary market garden methods of planting, cultivation, and irrigation were adhered to as nearly as possible. The plots were planted on 9th October and were dug on 16th March. Results are shown on the accompanying table. In discussing the results members considered that the mixtures generally recommended for potato growing were not suitable for the district, the results from the experiments confirming this opinion. Bonedust was the artificial manure most favoured, although a dressing of sulphate of ammonia after tubers were formed would probably have given even better results. Cow manure, if available in sufficient quantities, gave splendid results. The quantity used in the experimental plot was equal to a dressing of 32 tons per acre. The 2-2-1 mixture (super, ammonia, and potash) appeared to be worthy of further trial. The 2-2-1 plot was still fairly green at the time of digging, and gave the largest tubers, 14 weighing 28lbs. Twelve sets failed to come through, probably being burned by coming into direct contact with the fertiliser. A competition to produce the best crop of potatoes from a square rod of ground was suggested as a means of trying out a greater variety of manures, and was held over to the next meeting for consideration.

Plot No.	Manure.	Potatoes dug per Plot.				Rate per Acre.							Value per Acre.			Manure Cost per Acre.		
		Marketable.			Small.	Marketable.				Small and Rough.								
		Cwts.	Qrs.	Lbs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	£	s.	d.	£	s.	d.
1	4cwts. Stable Manure	2	0	19	6	17	6	0	16	8	2	8	104	11	5	10	0	0 (estimated)
2	4cwts. Cow Manure............	2	1	8	6	18	11	1	20	8	2	8	111	17	1	10	0	0 (estimated)
3	14lbs. 2-2-1 Super. Ammonia and Potash	2	0	8	3	16	11	1	20	4	1	4	99	8	7	9	7	6
4	14lbs. Jacob's Bone Manure	2	0	14	11	17	0	0	0	15	2	24	102	15	8	6	3	6
5	14lbs. P.N.P.	1	3	4	7	14	4	1	4	10	0	0	85	15	9	5	17	6
6	14lbs. Orchard Manure..........	1	3	24	3	15	14	1	4	4	1	4	94	9	11	5	17	6
7	14lbs. Bone Dust..............	2	0	18	4	17	5	2	24	5	2	24	103	19	11	5	10	0
8	14lbs. No. 1 Complete Manure ...	1	3	19	4	15	7	0	16	5	2	24	92	8	6	5	5	0

SOCIAL AT HILLTOWN.

Under the auspices of the Hilltown Branch a social was held on 16th April, when prizes won in the Midland District Wheat Crop Competition were presented. A splendid gathering resulted. Addresses were delivered by the Minister of Agriculture (Hon. A. P. Blesing, M.L.C.), Hon. W. G. Duncan, M.L.C., and Mr. W. J. Spafford (Deputy Director of Agriculture). The Hon. Minister presented trophies to the following competitors:—First—Mr. R. L. Sluggett, Hill River (93 per cent.). Second—Mr. P. McD. Smythe, Salter's Springs (91½ per cent.). Third—Mr. H. Schunke, Manoora (90½ per cent.). Fourth—Mr. S. Garrard, Mintaro (90 per cent.).

The prize donated by the Millers' Association for wheats other than Gallipoli, Ghurka, Waratah, and Nabawa was presented to Mr. R. L. Sluggett (Dan variety), with Mr. P. McD. Smythe (Ford) second. A special trophy for the cleanest crop (highest points in all sections except yield) was awarded to Mr. R. F. Thomas, Hallett (62.5 per cent.). A supper and dance followed. Thanks are due for the assistance given by the ladies.

CARE OF LIVESTOCK.

Paper by Messrs. T. A. Earl and C. N. Wallace, given at the Allandale East Branch meeting on 3rd April:—"*Horses.*—It is both wasteful and dangerous to feed hay loose to horses, as at this time of the year as well as in the middle of winter they tramp a lot into the ground, and in the dry weather, as they are picking around for the straws, they get a lot of dirt, &c., which is apt to cause digestive trouble, such as sand. Another common complaint among horses at this time of the year, when the hay is new, is colic, which is due to two factors. The horse relishes the new chaff, and bolts it without chewing it, and the moist, immature hay ferments more easily in the stomach, and causes an accumulation of gases. Wet or musty chaff will also cause colic. Horses should be well groomed in the morning to remove dirt and hair, especially on the shoulders. The skin cannot perform its functions properly unless it is kept clean. Shoulders and neck are liable to be chafed with the collar if grooming is neglected. Water horses regularly, and when a horse is over-heated allow him only a small quantity of water until he has cooled down. When working, always have the chains of equal length in order to avoid throwing undue strain on either shoulder. *Cattle.*—Dairy cattle, being more delicate than other farm stock, consequently need more attention. The cows should be kept in the best paddock available, and hand-fed during the winter months and dry periods. For green feed, if the rain comes early, barley makes good feed, but if the rain is late, oats are more suitable. A few acres of millet will greatly increase the milk production, and help to keep the cows in better health. It is advisable to feed hay or chaff during the winter months, as the cows relish some dry feed at this time. It is not necessary to feed during the spring, but as the feed goes off and one wants to keep up the milk supply, it is advisable to have a standby of summer fodder, such as maize, chou moellier, turnips, or mangolds. It is advisable, when feeding cows with chaff, to add a handful or two or bran and a small quantity of salt; also a quantity of Meggit's meal. A packet or two of drench should be on hand in case of sickness with stock. If there is not sufficient shade or shelter in a paddock it is a good plan to plant trees or shrubs. *Sheep.*—The Allandale land is more adapted to sheep raising than anything else. The most payable proposition generally is to raise lambs, either for fattening or for wool. It is always advisable to keep a good supply of coarse salt in the paddocks, as it keeps the sheep healthy, and aids digestion. Change the sheep regularly, and do not keep them too long in one paddock. Crutch sheep before the first sprout of green grass, preferably about the 1st of May. Ewes require the most attention at lambing time, because every lamb saved means at least 10s.

CARE OF FARM HORSES.

In the course of a paper read at the March meeting of the Booborowie Branch, Mr. H. Phillips stated:—"It is not a wise plan for farmers to breed the big, heavy stock for this district; the medium, "nuggetty" horse is preferable. This type of horse stands up to the work and conditions better, does more work in less time than the heavy horse, and requires less feed and water. As his livelihood largely depends on his horses, it behoves the farmer to give them reasonable care and attention. A good stable, warm in winter and cool in summer, will go a long way towards keeping horses fit and in good working condition. After long spells, horses should be stable-fed for a few days before beginning to work. Give them only a small amount for a start, and gradually get them used to feed. It is advisable to work them 2 or 3 hours on the first day, gradually increasing the length of time, until at the end of the week the teams should work full days without showing signs of distress. If horses are worked full time from the start they rapidly fall away in condition, besides getting badly scalded shoulders. Working horses are only capable of doing a given amount of work each day; if pushed beyond this point they lose condition, and one will not accomplish any more work—in fact, not as much, because the teams will be worn out, and not be able to travel so well. To get the maximum work from horses they should be carefully stabled, and have as much water as they will drink at least three times a day, and good, nourishing food—for preference, oaten hay chaff. Regular, punctual feeding is of paramount importance. Always feed enough, but not too much. Be sure that they always eat all the feed which is given to them. Horses should have free access to water; often times, when they first come in from work, they do not drink properly. Do not work horses after sundown, because the sweat is not likely to dry overnight, and therefore may cause a chill. To work horses half an hour after sundown is much more detrimental to their health than to work them several hours earlier in the morning. When driving horses do not ''push'' them. They will go their own pace, and will do much more work than ''pushed'' horses in the long run. Horses should be well groomed each morning before they are put to work. This not only adds to their appearance, but also assists in keeping them in good health. Horses should on no account be tied up overnight; if they are managed correctly they will all feed together at a long manger quite contentedly. The teams should be driven home from work, and not let run on their own accord, especially when there are brood mares among them. The teeth of horses should have careful attention. A large number of internal troubles are caused through bad teeth. Amateurs should not attempt the filing and cutting of the teeth. The hoofs should also be cut and trimmed whenever necessary. If they are left unattended for any length of time they split, and very often cause lameness. *Sore Shoulders.*—Prevention is always better than a cure; slight sores at times may be difficult, and perhaps impossible to avoid, but if a team of horses are well cared for one will seldom find sore shoulders. Collars should fit well, and be kept well lined and stuffed; sweat marks and dirt should be cleaned off the collars, and the horses' shoulders each morning before commencing work. The chains should be equal in length, and free from wire links. Mares in foal should be worked on the outside of the team, where they are not so likely to be bumped, and thus cause the loss of either the mare or foal. Mares in foal should not be turned out in paddocks to spell; they are likely to become over-fat, and when in this condition there is a danger of serious trouble at foaling. Mares that are used for breeding purposes should be kept out of any very heavy pulling; ordinary work will not hurt them, in fact, they should have light work until within a few days of foaling. When mares are about to foal they should be put in a separate paddock, away from the other horses, and, if possible, near the house, so that they can be watched and have attention, if necessary. Until foals are strong enough to look after themselves keep them with their mothers, away from the other horses. When weaning foals put them in a paddock where they can get plenty of exercise, water and feed, and out of sight of their mothers and other horses. If foals are properly handled from birth they require very little breaking in, and if the following method is adopted it will greatly minimise the risk of injury to both man and foal:—When the foal is only a few days old it should be caught and handled and stroked and have its legs lifted. A small halter should be put on the foal, and it should be tied up for a few minutes. This handling should be repeated every few days until the foal is thoroughly used to it; then it should be taught to lead. Foals should not be tied up with a rope around their necks; use a halter and a rope, and this will prevent choking down. If it is well grown a colt can commence light work at 2½ years, but only for about 2 hours a day for the first few days, gradually increasing the length of time until it is quite fit to work with the rest of the team. Commence working a young horse in fallowing time. At that period a few hours lost is not so important as at harvest or seeding.''

At the April meeting of the Morchard Branch a paper written by Mr. B. Koch advised breeding horses which were not too heavy in the legs. Heavy-legged horses carried a quantity of long hair around the fetlocks and if worked on wet or muddy land were liable to collect mud on their feet, becoming very slow and tired before the day was finished. An endeavour should be made to obtain a team even both in size and pace. A foal or two should be bred each year to keep up the strength of the team. Horses should be watered before being fed, otherwise they would contract indigestion or colic. They should be watered at least three times a day in summer. The trough should not be too close to the stable. If it were, the horse would carry a good deal of chaff and hay to the water. A team on heavy work would keep up its strength better if stable fed. Hay chaff should be fed morning, noon and evening, with plenty of crushed oats, and long hay at night. Grooming should be done every morning. If time could not be spared to groom the horse all over, the shoulders should be brushed to remove dried sweat, grooming being a great help in preventing sore shoulders. Collars should be a fairly tight fit, as a loose collar would soon cause a sore patch. With a team of more than seven horses tandem working was best, each horse being obliged to do his share of the work; the pull on the shoulders was less than with the shoulder swing. The stable should be open to the north; it would not be so cold at night, and the sun would shine in during the middle of the day.

The following paper was read by Mr. J. Kostera at a meeting of the Whitwarta Branch held on 16th March:—

The mainstay on most of the farms in South Australia is its team of horses. With a little care and careful management in the way they are fed, in the manner in which they are trained, and the attention to their health, they can be a team of good appearance and be admired by many a passer-by On a large proportion of farms, the horse is the most neglected animal; it does not get half the care and attention to which it is entitled.

Watering.—Horses should, if possible, be watered first and fed afterwards; this should be the general rule. However, it is not always convenient or possible to water before feeding, and very often the horse has a mind of its own and will not drink when one wants it to. In such a case if some little time elapses between feed and watering, the horse should not suffer any ill effects. The question also often arises whether a horse should drink when hot. It will not hurt him if he is used to it. Horses when grazing in the paddock should have access to water whenever they like, and attention should be paid to the watering troughs to see that they are kept clean and in good order.

Feeding.—This is a very important item of horse management, and the farmer must use his own discretion to a great extent. The mangers should not be filled and then left until empty before another refill. There are two wrongdoers in feeding horses—the man who under-feeds and the man who tips in too much at a time. I recommend feeding four times a day and giving each horse as much as it will eat and no more. The feed overnight should be heaviest, so that the horse will not be hungry in the morning and will require only a small feed for breakfast. Dinner should be the richest feed of the day, because the horse is usually given only a short time to eat. Oats rank as one of the best grains for horses, and have been found to be the finest feed for horses of speed and for those in very hard work. Horses will eat oats in preference to all other grain, and they may be fed whole or crushed.

The proper way to keep horses is to have a stable—a straw one will do if you cannot afford a better one. The managing of the horses in the stable is made much easier if every horse has its particular place or stall and is tied up, especially for the morning and mid-day feeds. The practice of tying up is by far the best, and has many advantages over other systems. Every horse learns to know its place, and will go to it at a word from its master. This system also has the advantage that every horse will get its share of feed and will not be bossed from one end of the stable to the other by one or two unruly horses. The harness can be hung on a peg at each horse's stall, which saves the necessity of running around the yard with a pair of winkers for a particular horse. Not only does this method save one's own energy and time when harnessing a team, but it teaches the horses to be quiet. Horses should be let loose at night so that they may go to water whenever they wish.

Grooming.—Each horse should be thoroughly brushed and groomed before going to work. Do not brush the shoulders alone, but go all over the animal, removing all sweat from the previous day's work. The little extra time involved is made worth while, it enhances the coat and helps to make the horse feel more comfortable, and also puts a better appearance on the animal. A straw stack near the stable may save a great deal of time when grooming, but do not let the straw stack do it all. A straw stack can also provide some shelter and warmth on a winter's night.

Harnessing and Sore Shoulders.—The collars should be close fitting, not too wide nor too long. Big collars are the cause of many sore shoulders. The hames should be fitted well up to the collar with the draft hook fairly high up from the point of the shoulders, for it is on the point of the shoulder that most sores occur. It is a common fault to see the points of the hames hanging down two, three, and even four inches from the collar. That is another source of sore shoulders. The hames should fit snugly around the collar and should be strapped tight. Tight hames also help to keep the collar together better. Sore shoulders are mostly caused by carelessness, lack of humanity, and bad management.

If a team is fed and handled on the lines suggested, with a good man in charge, the owner will have something to be proud of, and will not be far behind the tractor man at the end of five years.

RIVER MURRAY PRUNING COMPETITIONS.

At a Conference of River Murray Branches, held on 1st May, at Barmera, to consider rules and conditions of the forthcoming Competitions, the Secretary (Mr. J. J. Odgers) presented the following report on last year's competitions:—

The River Murray Pruning Competitions held during the past year were again successful, and at each district (Mypolonga, Barmera, Berri, Moorook, Cadell, and Waikerie) keen interest was shown, one pleasing feature being the number of junior competitors. In 1933 Mr. W. Langdon Parsons donated a fine silver cup for competition between districts, the ultimate winner being the most consistent pruner over a period of 3 years. This aroused interest, and each year the contest has been keen. The winner in 1933 was E. A. Liddicoat, Moorook, 548 points; 1934, H. M. Perkins, Berri, 539 points; 1935, C. Curtis, Waikerie, 549 points; whilst the most consistent over the period was C. Curtis, of Waikerie, with 1,618 points, closely followed by H. M. Perkins, Berri, with 1,615; A. Wedd, Mypolonga, 1,613; E. A. Liddicoat, Moorook, and W. E. Rout, Berri, 1612.

The Championship was held at Moorook, 15 competitors taking part, and the pruning was, as it should be, very good, only 3 points separating the 5 top competitors in the aggregate. The results were:—

Vines.—1st, H. M. Perkins, Berri, 283 points; 2nd, E. A. Liddicoat, Moorook, 282 points; 3rd, S. Loxton, Moorook, 281 points.

Trees.—1st, A. Wedd, Mypolonga, 266 points; 2nd (equal), G. Elliott, Waikerie, and W. H. Harris, Berri, 260 points.

The aggregate trophy, valued at 3 guineas, was presented by the Dried Fruits Board, and the winner was W. H. Harris, Berri, with 538 points. The other trophies were 2 cups, donated by the Royal A. and H. Society, for vines and trees respectively, and valuable manure trophies from Wallaroo-Mount Lyell Fertiliser Co. and Adelaide Chemical & Fertiliser Co. The donors of these various trophies have been staunch supporters of the competitions, and the committee appreciate their valuable assistance, which has added to the interest of the competitions.

A well-attended meeting was held in the evening at Moorook. Mr. J. B. Murdoch, member of the Advisory Board, addressed the meeting. The Secretary stated that Mypolonga had asked for a championship to be held there, and he asked pruners to discuss, and make a recommendation. This was done, and, after a good discussion, the pruners unanimously recommended the next championship to be held at Mypolonga.

MILLING QUALITY OF WHEATS.

At the April meeting of the Booleroo Centre Branch Mr. R. W. Reichstein reported on the results of tests conducted by him, and carried out by the Laura Milling Co., to ascertain the milling quality and gluten content of 8 varieties of wheat grown in the Booleroo Centre district. The wheat samples were tested by the "Pelshenke" wholemeal fermentation method, and the results were as follows:—

No.	Variety.	Soil.	Super.	Time of Sowing.	Test No. Mins.	Remarks.
1	Ranee ...	Red Clay	90lbs. Guano 33%	Mid June	35	About average.
2	Ranee ...	Dark Loam ...	60lbs. 45%	Early May	45	Fairly Good
3	Teakle ..	Red Clay	90lbs. Guano 33%	Late May	61	Very good (worth 1d. above F.A.Q. price).
4	Teakle ..	Dark Limestone	90lbs. 45%	Late May	44	Fair.
5	Nabawa .	(Rain 5·40in.)..	—	—	44	Good for Nabawa.
6	Ghurka .	(Rain 5in.)	91lbs. 45%	Mid June	29	No good.
7	Gallipoli .	Red Hard soil .	91lbs. 45%	Early July	33	The best we have tested for Gallipoli. (Usually under 25 minutes.)
8	Ranee 4H	Black loam (Rain 4·40in.)	120lbs. 45%	—	53	Good, should be worth 1d. over F.A.Q.

Mr. Reichstein stated that the test was made with the intention of finding out if there was any difference in the same wheat grown on different soils. Each sample had varied. No. 1, grown on red clay soil, was not as good as No. 2, the same wheat grown on a dark loam. With Teakle the position was reversed, that grown on a red clay giving a better test than that from a dark limestone soil. Ghurka showed a poor test, while Gallipoli gave a better test than was usual from samples of that variety. The 53min. test from Ranee 4H was very good for that variety. The dryness of the season might have contributed to the enhanced milling quality and gluten content of the wheats.

HARVEST REPORTS.

Members present at a meeting of the Frayville Branch on 5th March gave reports of their harvest results as follows:—W. Lindner: Ranee 8 bags, Sword 7, Nabawa 7½, stubble 10bush. H. Rosenzweig: Nabawa 8 bags, Sword 5, Ranee 5, ploughed ground 3 bags. W. R. Pese: Ranee and Sword 8 bags, Ghurka 6 bags (finished very badly), ploughed land, oats 5 bags, barley 4 bags. H. B. Scheer: Sword 19bush., Nabawa 11bush., oats 6½ bags. E. Hoffman: Gluyas 8 bags, Currawa 6, Sword 5, Nabawa 5, late sown Sword 3½ bags. O. Rosenzweig: Oats 15-16 bags; where super was sown 6 weeks before usual seeding time no apparent difference resulted. H. Krause: Sword and Ranee 7 bags, Ranee 4H 4½ bags (badly rust infected), oats 7 bags (badly shaken). G. A. Quast: Best return from Nabawa, 6 bags. S. A. Bretag: Ranee 4H 27-28bush., Ghurka 22 bush. (infected with rust), Sword 22bush., Nabawa 17bush.

WARRAMBOO.—A meeting was held on 3rd April, when 8 members gave reports of their harvest results. Members agreed that stubble ground gave best results where sown early and dry. Cape barley seemed to be more suitable for feed than malt. One member had sown both in the same paddock. The stock lived on the Cape barley, leaving the malt alone. Two members reported best results from grass land cultivated early and worked after the rains. Members agreed that fallow should be ploughed early and worked as little as possible until the autumn in order to avoid drift, keeping the land as clean as possible by the use of sheep. Ranee wheat gave promise of yielding well in the Warramboo district.

QUESTION BOX.

A "Question Box" was the subject of the meeting of the Wallala Branch on 14th March, nine members being present. Among the questions dealt with were the following:—*Question:* Is it safe to use a poison cart for poisoning rabbits where sheep are being grazed? *Reply:* Yes, provided care is taken to see that the baits are properly covered. The use of a drill harrow would assist in covering the baits. *Question:* Best method of dealing with rabbits? *Reply:* The poison cart followed with cyanide Sulphur and saltpetre were also recommended. *Question:* Best oil to use in farm machinery? *Reply:* Vegetable oils were best, but owing to their high cost, mineral oils of the best grade were recommended.

Millicent.—At a meeting of the Branch held on 27th March the following questions were dealt with:—

"Top Dressing Twice Yearly."—Mr. Skeer asked if any member had had experience with top dressing twice a year. He had heard that two applications were given in parts of Victoria. Messrs. Reschke and Soper, of the Coonawarra Branch, gave some interesting information. Mr. Reschke said he had tried it with success on a 20-acre paddock. The first application was a cwt. of superphosphate, and the second application was 80lbs. Mr. Soper said that in Victoria it was the usual custom to top dress twice annually. For the first three years a cwt. of super to the acre was used, but after that 1cwt. to the acre in two dressings of equal quantity. He found that in some seasons feed grew prolifically and to a great height, and he would not advise the double dressing unless it was proposed to cut the grass for clover hay. One objection to the denser growth was the encouragement of footrot. Mr. R. A. Hately said he did not think double dressings were advisable in areas where the rainfall was under 20in.

"Footrot."—The statement that increased growth would encourage footrot caused quite an interesting discussion. Mr. Skeer said he had read quite a lot about the subject recently. One authority claimed that the germ was in the soil, but if sheep were not in the paddock, it would not stay in the ground more than 30 days. Another authority claimed that infestation was caused by carriers, and if these were not treated, trouble would necessarily follow.

Mr. R. A. Hately quoted his experience of 12 months ago, when he purchased two flocks of sheep on the same day. They were put together in one paddock. One of the mobs developed footrot, but in the other there was no sign of the disease.

Mr. L. L. Hately said he had known a case where affected sheep were running in the same paddock as other sheep which did not become affected.

Mr. Reschke said footrot was easily overcome with foot baths. He said he had an instance where 30 lambing ewes in a flock of 1,000 sheep were affected. They were treated with formalin and spirits of salts, and the following year there was no sign of trouble. He was satisfied there were two distinct types of footrot; one was a germ in the blood, and the other was in the soil.

Mr. Skeer said he had treated affected sheep with formalin, and one application had been sufficient.

Mr. H. J. Hutchesson said he had constructed footbaths and had used bluestone with success. He had not been greatly troubled with the disease.

Mr. Reschke advocated making footbaths 25ft. long, 10ft. wide, and 6in. deep. He said sheep should be left in the bath for about two hours. If sheepowners all had footbaths there would be little trouble with footrot.

Pygery.—At a meeting on 7th April, when eight members were present, Mr. Edmonds asked why various brands of super ran through the drill at different rates? *Reply:* New super appeared to be moist and ran slowly, while old, dry super ran more quickly. *Question:* Best quantity of super to sow per acre? *Reply:* Members preferred to sow at the rate of 1bush. per acre. *Question:* Has any member tried shares on harrows? *Reply:* They were effective if used when weeds were young. With four leaves of harrows an extra horse would be required.

CARE OF THE FARM ENGINE.

In the course of a paper read at a meeting of the Boor's Plains Branch on 2nd April; Mr. A. Adams stated that overloading was an enemy to any engine and was unfortunately too often in evidence. Overloading was particularly hard on a tractor or stationary engine, which had to perform its task hour after hour without any respite. Cooling was important. An engine could not give best results if it was overheating. Overheating could be caused by such factors as dirty tanks or radiator, slipping fan belt, weak or late ignition, worn piston rings allowing gases to escape between piston and cylinder walls, faulty lubrication, or excessively weak fuel mixture. If the above items were in order and the engine was not overloaded the minimum of trouble should be experienced. Ignition of most farm engines was by the magneto system. The magneto should be kept clean, with the contact breaker points working freely and adjusted correctly to a gap about 1/32in. Emery should never be used for cleaning the distributor, because it roughened the surface, thus causing rapid wear of the carbon brushes and consequent misfiring; a drop of petrol or kerosene on a clean rag was the best method. Filing of the contact breaker points should be done sparingly, more points being filed away than were burnt out. For grinding valves a fine valve grinding paste was best. After grinding, the head of the valve should be dipped in kerosene, the seat thoroughly cleaned to remove all grinding paste, and the valve rotated in its seat in the same manner as when grinding. The result would be a glassy finish on the valve and seat. Valve seat cutters should be used very sparingly and all valves kept in their respective places. Slightly more tappet clearance on the exhaust valves than on the inlet would help to avoid burnt exhaust valves. Before fitting new rings, all carbon should be scraped from the grooves in order that the rings should not bind. The rings should then be fitted to the cylinder leaving a small gap for heat expansion. To avoid rings dropping into the wrong groove the rings could be slipped on over three thin strips of tin. In the case of oil engines it was important that the blow lamp should work correctly. The engine should be well heated before attempting to start it, although overheating should be avoided, because it tended to cause the engine to smoke and back-fire, as well as damaging the heat coil. Petrol-kero. engines should be well warmed before switching on to kerosene. An insufficiently warmed engine could not burn unvaporised fuel, which would find its way past the pistons, destroying the lubrication of the cylinders and diluting the oil in the sump. It was important to be sure that the engine had an ample supply of good lubricating oil. Where an engine was running well it was not advisable to tamper with it in order to correct some fancied trouble. Cleaning of the outside surface was not as important as regular attention to the working parts.

BEE KEEPING.

Paper read by Mr. W. G. Ahrens at a meeting of the Greenock Branch on 16th March, 1936:—For most successful beekeeping, I consider the following five points to be the most important:

1. A good locality.
2. Mobility.
3. Standard hives.
4. A good strain of bees.
5. Young queens.

1. *Locality.*—By a good locality, I mean one where there is sufficient honey-yielding flora within a radius of two miles of the apiary for the bees to work on. The red gum constitutes the chief source of supply in South Australia. The quality of red gum honey is second to none, excepting perhaps, lucerne honey. The drawback of the red gum is that it flowers only every other year, and large beekeepers are therefore compelled to move their bees to other parts during the off season.

2. *Mobility.*—It is very important that a man who relies on beekeeping for a living, should be in a position to take advantage of every honey flow that may take place, within reasonable distance, and for this purpose a motor lorry is very necessary.

3. *Standard Hives.*—Most of you have had the experience of stacking fruit trays of uneven sizes, and you are well aware that apart from the inconvenience and waste of time, the moral influence is very bad. The same applies to hives only more so. Hives and frames, must be absolutely standard if the owner wants to avoid an early grave.

4. *Strain of Bees.*—The two most popular strains of bees in Australia, are Golden Italians and leather-coloured Italians, although the Carnolian black bee appears to be gaining favour in some localities. Of the first two, I prefer the leather-coloured Italians. The Goldens are often better honey gatherers, but do not stand the winter so well, and sometimes come through very weak, or die altogether. Black bees work very well at times, but are inclined to swarm too much. The chief aim of a beekeeper should be the production of honey. The amateur beekeeper is inclined to lose sight of this important point, and concentrates on the multiplication of colonies, with the result that by the end of the season, he has a lot of bees, but not much honey, because bees that are rearing excessive brood cannot store a great deal of honey.

5. *Queen Bee.*—No beekeeper can hope to be successful unless he is prepared to devote a fair amount of time to requeening. That means replacing the old queen by a young one, not when the old one is worn out, but as soon as she is past her prime. To emphasise the importance of this point I quote a few figures. (1) A strong colony contains anything from 30,000 to 50,000 bees; (2) the average life of the worker bees, during the busy season, is about 6 weeks. The wastage of bees during the long summer day is tremendous, and this wastage must be replaced to keep the swarm up to strength, and for these reinforcements we rely wholly and solely on the queen. Now everyone knows that to keep a Leghorn hen laying at the rate of one egg per day she must be young, and in good condition. The same applies to a queen bee if she is to lay 1,000 eggs per day, which she should be quite capable of doing. To accomplish this, it is also necessary that she should be fed on highly concentrated food. The workers attend to this. In fact the queen is quite incapable of feeding herself. If shut in a cage with an abundance of food she will be dead within a few hours. In view of the fact that in this district we have a honey flow only every other year, and that it lasts only about six weeks when it does come, it will be readily seen how disastrous it would be should one's queens become feeble or die just at the commencement of the honey flow. The last of her progeny would emerge from the cells within 21 days and then the swarm would dwindle very rapidly. The swarm is composed of three kinds of bees—drones, workers and the queens. Most people seem to be under the impression that drones are absolutely useless, but that is not the case. They certainly do not work, but are very necessary all the same. The beekeeper will obtain no young bees unless he has drones in his apiary; they are the male bees.

Workers.—Gale (page 64) states:—"Working bees are the rank and file of the hive: the architects, the builders, the preparers of building materials, the purveyors, the cooks, the nurses, the inspectors of nuisances. and scavengers, the sentinels, and the defenders. All and every bee, when at home, has to fulfil these and many other other duties, at some time during her indoor life, from the day she escapes from the chrysalis, till she goes out to procure home supplies."

Queen Bee.—The queen lays two kinds of eggs, male and female, and she can determine the sex of the egg as she lays it. These eggs if not interfered with, will hatch two kinds of bees, drones (males) and workers (females). Now the question arises, "Where do the young queens come from?" They are simply manufactured by worker bees, from worker eggs. It is possible for the bees to produce a perfect queen from any worker egg. The eggs selected for queen production are supplied with a special food commonly called royal jelly, which completely alters their development. The effects produced by this special food are:—(1) The young queen reaches maturity in 16 days instead of 21 (that being the period required for the development of a young worker bee) although being more fully developed it should, according to ordinary analogy, require longer; (2) its organs of reproduction are completely developed, so that it can fulfil the office of a mother; (3) its size, shape, and colour are greatly altered, its lower jaws are shorter, its head rounder, an its abdomen without the receptacles for secreting wax, its hind legs have neither brushes nor baskets. The first thing the young queen does, when she emerges from the cell, is to search the hive for other queen cells and destroy them should she find any. On the sixth or seventh day after emerging from the cell, she will leave the hive in search of a mate. This is the only time a queen leaves the hive, excepting when she issues forth with a swarm, and as beekeepers don't encourage swarming, the majority of queens leave the hive but once during their lifetime. The mating takes place in mid-air, and the queen then returns to the hive. She is now fertile for life, one mating being sufficient. The drone also mates but once, as he dies the same day. About four days after mating the young queen will start laying, and will continue to do so until displaced by another queen. Remember that in beekeeping over 50 per cent. of the diseases originate in the "side-liner's" apiary, therefore, for the sake of those who rely solely on beekeeping for a living, look after your two or three swarms, and keep them free from disease. Never try to nurse a weak swarm through the winter, unite it with a stronger one. See that your bees have ample stores before the cold weather sets in, then leave them severely alone until the following spring. Do not expect the bees to get to know you; they are here but a little while, you are here a comparatively long time, therefore it is your place to get to know the bees and treat them accordingly. Do not get excited if you happen to get more than your usual quota of stings. Excitement is contagious, and when bees get excited their temper is not improved. If you must retire, do so with as much grace as possible; an orderly retreat is never so humiliating as an absolute rout.

SEEDING PREPARATIONS.

The following paper was read by Mr. W. A. Mills at the April meeting of the Booleroo Centre Branch:—

At this time of the year quite a lot of preparatory work can be done in readiness for seeding.

Seed wheat can be graded and pickled, and if horses are being used a good quantity of hay can be chaffed. Swings and chains can be overhauled, harrows prepared, and other implements seen to.

As far as working the land is concerned, one cannot do much when the land is dry, but if rain falls it is quite a good idea to go over the fallows with the harrows, thus helping the weeds to germinate and at the same time conserving the moisture, leaving the land in good order for the combine and helping to form a good solid seed bed.

No definite time to start seeding can be set down; this entirely rests with the condition of the fallow and the weather conditions. If one waits for the rains, the land works better, one can deal with the weeds, the grain germinates better, and the crop stands the hot winds better in the spring on land seeded damp. The month of May is preferable for seeding if conditions are favourable but the last two seasons have shown that no definite tim can be laid dow.n

The quantity of seed and super to use per acre rests with the individual farmer. In sowing Ranee 50lbs. of seed per acre for this district is quite sufficient. Ranee stools out well, and if sown very thick the heads are inclined to be small as well as the grain. If an early variety is sown for hay more seed per acre is needed to ensure a thick crop.

The quantity of super depends entirely on the nature of the soil. Red stiff land needs more super, but on mallee and limestone ground 60lbs. per acre is quite a fair dressing.

The above was the subject of a paper read at a meeting of the Redhill Branch by Mr. I. L. Jones who stated that the recognised basis for sucessful wheat farming was fallowed land. The benefits of fallow were (1) Conservation of moisture (2) Accumulation of nitrogen (3) Control of weeds (4) Larger area of land in good condition for seeding. For years it was thought that the main aim in fallowing was to conserve moisture. It was now found that the fallowing promoted nitrates in the soil essential to the growing plant. The accumulation of nitrogen in the soil occurred most in Spring when the temperatures were rising and in Autum when temperatures were falling. It was obvious that early fallow would have a big advantage. Spring workings of early fallow would result in increased aeration of the soil, which played a big part in the accumulation of nitrogen. Lack of nitrogen in crops was evidenced by the yellowing of the flag, poor stooling, and spindly plants. With a good fallow was associated a good, firm seedbed, in which plants would thrive better than if sown in loose, cloddy soil. The surface soil covering the seedbed should be free from clods, which held no moisture. Sheep played an important part in forming a good surface mulch by tamping the ground and breaking up soft clods. Fallow should not be ploughed too deeply. Deep working required more attention and was liable to promote take-all. Stubble should not be ploughed in, as it keep the soil too open. Good fallow shoud be sown with good, selected and graded seed. Dry pickling was more satisfactory as well as more convenient than the bluestone method.

In the course of a paper read at the April meeting of the Monarto South Branch Mr. H. Patterson said that recent summer rains had made quite a lot of fallow working necessary. Where a springtooth was used it was very necessary to use it often and at the correct time, especially where dandelion was troublesome. The use of shares which were no longer efficient was a bad practice, especially just before seeding. All heavy land should be fallowed where possible. The best treatment for light soils was to plough or cultivate early, and after leaving the land for the time, harrow it and sow with barley and oats by means of a combine. Seed should be graded or recleaned and pickled, dry pickle being recommended. One bag of super per 2 acres was a suitable dressing for average soils, and with the reduced price it was better to use a little more rather than a little less. The time of sowing suggested was from the last week in April to the second week in June.

BARLEY GROWING.

[Paper by Mr. G. G. Pearson read at a meeting held at Yeelanna, 1st April, 1936.]

Soil and Climatic Conditions play so important a part in barley production as to make a few remarks under this heading essential. So far as the bulk of the area sown in South Australia, other than the extreme south-east is concerned, most is in the good rainfall districts with a subsoil of good clay not too deeply removed from the surface. Areas where broom and mallee thrive together in their natural state can be relied on to produce a reliable sample of barley almost every year. Much harm has been done to the industry by attempting to grow barley in unsuitable areas and producing poor samples which depress the market both by reason of their quantity and quality and thereby prevent the grower in suitable areas from receiving adequate return for his better product. The district here should, in my opinion, be the equal of any place in South Australia as a barley-growing area.

Marketing Conditions also have a considerable bearing on the question, so much so that the area sown, type, and rotation have to be considered in relation to them. Quality should be the first consideration, for only a good type is readily saleable and a lighter crop saleable as first grade barley should be aimed at in preference to a heavy crop which has far less chance of good maturity. I would strongly stress this point in the interests of the industry generally, and think it will be found that only unusually good finishing conditions will mature a heavy crop.

Types.—The Chevalier and Pryor types are most popular as a two-row type and are generally known as English barley. They suit local maltsters, are a good stubble crop following wheat, mature early so as to be out of the way before wheat is ripe, and provide very palatable dry feed for stock when grass paddocks are nearly done. In addition, the straw is easily converted into a mulch and provides an easy way of getting good humus into the soil if ploughed under at fallowing time, which on older land is to be preferred to burning. The six-row type has many disadvantages, and although it often yields more heavily and does not lodge or break off much, has a much smaller market, particularly if not of the best quality. It has a coarse, fibrous straw not nearly so much relished by sheep and, so experts warn us, makes a very much greater demand on the components of the soil needed by the wheat crop. This is proved by the experience of a neighbour of mine who grew five crops of English barley in successive years on the same piece of land. His last crop returned nearly 20bush. per acre, after which he fallowed the land and grew 30bush. of wheat without any sign of weakness whatsoever. In contrast to this we are warned by experts to be wary of the effect of even one crop of the Californian type on the ensuing crop of wheat.

Stubble-Grass or Fallow—Barley on fallow is rarely practised and is to be discouraged for reasons of the quality of the grain. The plant invariably makes prodigious straw growth and matures a poor grain, though, of course, a heavy yield, but not sufficiently heavy to compensate for the cost of fallowing. Some farmers on Yorke Peninsula have stated that they intend to discontinue sowing barley on stubble land after wheat on account of unsatisfactory returns and intend to use ley land entirely for this crop. This is wrong, for several reasons. The state of the market is probably the strongest reason, as has been cited earlier. An analysis of my experience seems to suggest that the stubble crop is almost as payable as the grass. Soil preparation is cheaper, super dressings lighter, a better rotation is possible, and the quality is almost assured. I have never grown a second grade sample on stubble land, and have reaped 15 bags per acre. With the correct method of soil preparation stubble land will produce a satisfactory crop, and if practised more generally would pay the grower better in the long run.

Soil Preparation—Grass Land.—If a heavy body of dry feed covers the land, burn off the grass where it will run. Generally speaking, grass that will not carry a running fire is no deterrent, either to the working or to the crop. If time permits plough the land with the opening rains and give it a harrowing, but no advantage is gained by ploughing too early. I have frequently left the breaking up to be done during wet spells at seeding time and found it quite successful. Ploughing too early will probably mean an extra working to kill weeds which is not otherwise needed. Do not work dry nor too fine. What is good wheat preparation is not necessarily good for barley. Later ploughing kills a good crop of weeds and probably the bulk of the dandelion; then when wheat is sown or early in June a working with the combine will get another crop of weeds. The crop may be sown almost immediately afterwards. It may seem possible to do the sowing together with the cultivation and thus save a working, but I would strongly discourage this. The extra run over will pay in a cleaner crop and better yields. If conditions are so dry as to kill all weeds in one operation then be assured that it is too dry to be working barley ground at all. A suggested dressing is 60lbs. seed and 100-112lbs. high grade super. Barley may be sown very wet, if not planted too deeply, and good results will follow.

Stubble Land.—Burn stubble as late as may assure a clean burn, and on as calm a day as possible. Burn on small areas if convenient and harrow each piece at once. The cooler the day and the calmer it is the greater bulk of valuable ash will be conserved. The land may now be left until it is convenient to work it, the green growth being kept in check with sheep. Do not be tempted to work up dry, although it may work up well and cheaply. It may be all right if wet conditions follow, but in dry years it is fatal to good results. Work up well when convenient with a share-plough or heavy bridle-cultivator. If very rough give a harrowing before or after sowing with about 60lbs. seed and half a bag of super about the middle of June but not before. If early ploughed it may be necessary to work again, but unless the land is dirty no advantage is gained. However, do not work dry.

Subsequent Treatment.—There are some who advise and practice harrowing the crop when stooling, say about the third week in August. Although not always necessary, it is beneficial to crops sown earlier, and in dry years when wet workings are not always possible. The need is indicated by a period when growth seems to stop and the crop seems inclined to thin out instead of stooling. The colour lightens and the plant assumes a stale, frost-bitten appearance. Harrow heavily at this stage. If the ground is not too loose and the plants well established, a few plants pulled out will not matter. If crop has been sown and worked wet, and not too early, and has a deep green bunchy appearance and is stooling well, harrowing is not warranted. The crop may now safely be left to the climatic conditions to mature.

Summary.—Sow clean seed pickled wet with formalin. Use the plough or heavy cultivator for first working up. Work as wet as you can and not too finely. Give grass land the extra cultivation, and use harrows on the crop if necessary. Do not sow too deeply nor too heavily.

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"First Aid to the Horse" by F. E. Place, B.V.Sc., M.R.C.V.S. Price 3s., Posted, 3s. 2d.

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SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		SOUTH-EASTERN DISTRICT.		
Millicent	27/3/36	14	Questions	L. C. Hutchesson
Mundalla	31/3/36	16	"Soldering"—L. M. Dinning	A. Ross
Allandale East	3/4/36	12	"Care of Livestock"—C. V. Wallace and T. A. Earl	R. T. Laslett
Rendelsham	7/4/36	—	Address—W. J. Spafford	F. Todd, jun.
Tantanoola	4/4/36	8	"Rugging Sheep"—L. R. Arness	L. J. C. Osborne
Penola	17/4/36	8	Conference Reports	F. W. Hinze
		UPPER NORTH DISTRICT.		
Appila	3/4/36	15	"Ailments of Stock"—J. C. Rundle	E. H. Wurst
Baroota	9/3/36	11	"Farm Bookkeeping"—W. Spencer	E. W. Hulstor
Wilmington	9/4/36	15	Address—E. L. Orchard	Chas. Cole
Warcowie	7/4/36	7	Address—E. L. Orchard	A. F. Crossman
Morchard	13/3/36	7	"Milling Qualities"—G. Addison	E. Tilbrook
Morchard	17/4/36	10	"Farm Team"—C. Halliday; "Concrete Posts," A. I. McCallum	E. Tilbrook
Booleroo Centre	3/4/36	5	"Seeding Preparations"—W. A. Mills	J. J. McCarthy
		MID-NORTH DISTRICT.		
Booborowie	23/3/36	12	Papers—H. Phillips and T. J. Wedding	A. T. Fairchild, jun.
Narridy	24/3/36	25	Address—R. C. Scott	J. Klingner
Wandearah	2/4/36	26	Address—J. C. Rundle	L. A. Jacobs
Redhill	14/4/36	10	"Seeding Preparations"—I. L. Jones	L. Harris
Hilltown	16/4/36	—	Social and Presentation of Crop Competition Prizes	L. J. Harvey
Beetaloo Valley	20/4/36	10	"Vegetable Growing"—J. Ryan	B. W. Giddings
		LOWER NORTH DISTRICT.		
Wasleys	5/3/36	14	Owen Conference Report	C. R. Currie
Stockport	30/3/36	10	Paper from *Journal*	R. V. Koch
Brownlow	8/4/36	10	"Farm Outbuildings"—A. O. Steinborner	V. G. Semmler
Lyndoch	7/4/36	10	Address—M. W. Aird	J. S. Hammat
Lyndoch	3/3/36	6	Discussion; Show Exhibit	J. S. Hammat
Wasleys	2/4/36	19	Address—H. B. Battye	C. R. Currie
Buchanan	26/3/36	21	Address—W. C. Johnston	W. G. Hucks
Light's Pass	6/4/36	15	"Farm Gates."—Hon. Sec.	C. A. Verrall
Black Springs	31/3/36	12	Address—W. C. Johnston	K. H. Dunn
Upper Wakefield	5/4/36	15	"The Rise of the Sheep Industry"—E. McDougall	H. W. Gregor
Rosedale	21/4/36	—	Annual Social	W. E. Georg
Truro	20/4/36	50	Annual Social	L. S. Davis
Greenock	16/3/36	20	"Beekeeping"—W. G. Ahrens	A. Schubert
Greenock	20/4/36	18	"Labour-Saving Devices" C. M. Roennfeldt	A. Schubert
Tarlee	21/4/36	12	Address—W. C. Johnston	N. L. Clarke

OTHER REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		YORKE PENINSULA DISTRICT.		
Boor's Plains ..	2/4/36	17	"Care of Farm Engine"—A. Adams	S. G. Chynoweth
South Kilkerran	6/4/36	21	"Lavatories"—E. F. Hoinrich	R. E. Hasting
South Kilkerran	20/4/36	24	Address—C. A. Goddard	R. E. Hasting
Weavers	6/4/36	9	Conference Delegates' Reports	H. W. Cornish
		WESTERN DISTRICT.		
Kyancutta	3/3/36	14	Presentation of Crop Competition Trophies	E. A. Kelly
Pinbong	9/3/36	18	Discussion—Programme .	D. O. Scholz
Wallala	14/3/36	9	Question Box	C. F. Zippel
Yeelanna	1/4/36	—	"Barley Growing"—G. G. Pearson	R. R. Wilson
Kelly	4/4/36	25	Address—H. D. Adams .	F. R. Illman
Warramboo	3/4/36	9	Harvest Reports	P. E. C. Daniel
Chilpuddie Rock	8/4/36	9	Paper from *Journal*	H. Brown
Goode	8/4/36	12	Address—W. H. Brownrigg	B. A. Linke
Maltee	2/4/36	8	Question Box	E. Schwarz
Ungarra	6/4/36	13	Address—H. D. Adams ..	W. G. Gordon
Green Patch ...	2/4/36	18	Address—H. D. Adams .	C. J. Whillas
Pygery	7/4/36	8	Question Box	A. Day
Mount Hope....	14/4/36	11	Address—G. A. Vigar....	J. L. Vigar
Koppio	8/4/36	20	Discussion—"Footrot" .	M. T. Gardner
Butler	16/4/36	12	Debate—"Cultivators and Drill *v.* Combine	C. F. Jericho
		EASTERN DISTRICT.		
Paruna	1/4/36	12	Address—R. L. Griffiths .	F. R. Sumner
Taplan	30/3/36	7	"Future of Mallee Lands"—Hon. Sec.	P. R. Hodge
Devlin's Pound .	22/4/36	16	"The River Fishing Industry"—F. W. Haeusler	H. A. Loffler
		SOUTH AND HILLS DISTRICT.		
Frayville	5/3/36	—	Annual Meeting	H. H. Ramm
Frayville	2/4/36	18	"Colt Breaking"—A. C. Hinton	H. H. Ramm
Currency Creek .	10/3/36	12	Address—V. Ward	D. Jeff. Gordon
Cherry Gardens	4/4/36	6	Homestead Meeting	A. R. Stone
McLaren Flat...	2/4/36	21	"Pollination"—B. Rake	P. T. Wait
Blackheath	9/4/36	8	Paper from *Journal*	E. H. Paech
Currency Creek .	7/4/36	9	Question Night	D. Jeff. Gordon
Hartley	1/4/36	32	Annual Social	W. J. Brook
Carey s Gully ..	6/4/36	6	Report of Potato Experi-Experiments	L. Neighbour
Hope Forest ...	6/4/36	17	Address—"Superphosphate"	H. J. Hunter
Inman Valley...	21/4/36	18	Address—R. Hill........	S. F. Hacklin
Monarto South .	25/4/36	14	"Seeding Time"—H. Patterson	C. F. Altmann

WOMEN'S BRANCHES.

SUBJECTS FOR BUREAU MEETINGS.

If you have no other subject in mind, here is a list from which you might choose when asked to contribute to your branch programme.

The Farm.

- Dairying—
  - Care of Milk and Cream
  - Buttermaking
  - Cheesemaking
- Pigs—
  - Bacon Curing
- Beekeeping—
  - Honey
- Horticulture—
  - Vegetable Growing
  - Flower Growing
- Poultry—
  - Dressing
  - Incubation
  - Rearing Chicks
  - Turkeys
  - Ducks

The Home.

- Home Management—
  - Furniture—
    - Choice
    - Repairing
  - Needlework
  - Knitting
  - Rugmaking
- Clothing—
  - Choice
  - Repairing
- Dressmaking
- Pattern Afternoon
- Children—
  - Care and Management
- Cooking—
  - Recipes
  - Recipes for Christmas
- Lunches
- Jam Making
- Fruit Preserving
- Fruit Drying
- Fruit, Value of
- Pickles and Sauces
- Sweet Making
- Exhibition of Home Crafts
- Christmas Gifts
- Home Nursing

General.

- Inter-Branch Visits
- Competitive Exhibition
- Flower Show
- Practical Demonstrations
- Social
- Music in the Home
- Good Reading
- Hobbies
- Physical Culture
- Labor Saving Hints
- Spring Cleaning
- Entertainment in the Home.

BUREAU CONFERENCE AT KYBYBOLITE.

Mrs. E. C. H. Schinkel presided over the Women's Sessions of the Lower South-East Bureau Conference, which was held at Kybybolite on 8th April.

A demonstration of Rug Making was given by Mrs. Harrison, of Naracoorte, and Miss E. Campbell (Education Department) delivered an address, "Balanced Diets."

'FANCY WORK.'

[Miss Audrey Marks, Penola.]

During the past few years fancy work of various kinds has become a very popular form of relaxation for most womenfolk, and instead of being regarded as merely a pastime for idle hands, as it possibly was a generation or two ago, the art of embroidery work can now be looked upon as being something of a necessity in a household, and many an hour can be spent in the long winter evenings as a pleasant pastime, especially for those who live in the country, where there are not the attractions that there are in the cities.

For years "fancy work" stood at almost one thing, and the ideas for linen work were not so varied or fascinating as they have become of later years.

The most necessary item for needlework is neatness. Loose ends, big knots, and jump-over stitches are most unsightly and unnecessary.

Always have clean hands. White work is very easily soiled, and this often loses points for one's work when it is judged. A lemon cut in halves and rubbed well into the hands cleans them well after gardening or any rough work. A very fine needle, and one strand of the cotton gives the best results when doing fine work.

It is better not to handle the work more than necessary, as it soon loses its sheen. There are numerous kinds of stitches, the three types of stitches which are used most frequently, and especially by the beginner, being Lazy Daisy, Satin, and Stem stitch. These are very easy to learn, and very effective.

There are other stitches, more intricate, that may be used at later stages, such as Indian Filling, Eyelets, Bullions, Richlieu Embroidery, Hedebo, and Drawn Threadwork.

Indian Filling is mostly used when doing coloured work, and is very effective when the shades used are blended. It is a long and short Satin Stitch alternately, the length of stitches varying according to the work being done. When working this stitch on poplin, always have stitches running with the grain of the material, otherwise it will pucker.

Satin Stitch is another much-used stitch, which must be well padded to raise it and give it the desired effect. Padding braid can be obtained in various widths, and saves a great deal of time in padding stems or ribbon bows.

The *Bullion Stitch* is used for rosebud designs.

Hedebo has come into prominence just recently, and is a very dainty and effective stitch.

Richelieu Embroidery is a beautiful work when executed properly in a good design. Richelieu washes well, and will stand a great amount of hard usage. In this work always buttonhole bars first, then buttonhole outlines, catching bars firmly at the same time. Richelieu work should be thoroughly pressed before it is cut out. Adding buttonhole picots to the centre of each bar gives a very pretty effect. The blending of colours can create a very interesting study, and one which any person can accomplish as there are now so many pastel shades on the market from which to select.

By the introduction of coloured threads and embroidering in these lovely shades the present-day fancywork is extremely fascinating. When one views the lovely specimens of work exhibited at shows and exhibitions one realises how high a standard of excellence can be obtained by anyone who may take care and patience in their stitchery.

Edges are another point to be considered. While there are many crochet edges, needlepoint, and the old form of handicraft known as tatting have now become very popular.

Embroidery must never be washed before being entered for competition at shows; if it has gone a little yellow in the making it is better to leave it alone rather than try to clean it. Judges realise that in some instances this is unavoidable.

When pressing the work place it on several thicknesses of turkish towelling or blanket, and press it on the wrong side with a damp cloth placed on it.

Careful mounting of the work makes all the difference, and it is always better to do this on fresh blue paper or cardboard rather than on other shades. This, of course, applies to white work—the blue will counteract any yellowness in the work.

"BENEFITS ARISING OUT OF BUREAU MEETINGS."

[Mrs. E. GOLDING, Mundalla.]

There is an old saying that we learn by our mistakes, but it is rather an expensive method. It is far cheaper to learn from the mistakes—or the experience—of others.

In the Bureau there are many women who excel in various branches of what is regarded as "women's work," such as the making of butter, jam and preserves, the baking of bread, dressmaking, and the hundred and one other things incidental to housekeeping.

The Bureau confers on its members the right to obtain knowledge under very happy social conditions. The Bureau also provides lecturers from various Government Departments, who are able to advise on matters relative to our work.

To the more fortunate members there is a visit to Adelaide to attend the Conference of Country Branches—the Annual Congress. Here one comes in contact and makes freinds with women from all parts of the State. Lectures are given by experts in various subjects, and interesting visits of educational value are arranged.

The social side of the meeting must not be overlooked. It affords great pleasure to meet and make new friends. I appeal to all those who are not as yet members of the Bureau to join, especially the younger ladies, for to them the Bureau can provide a fine training in domestic science. Keep your Branch together by your regular attendance, and make it interesting at all times.

EXHIBITION OF WOMEN'S HANDICRAFT AT KARTE.

Truly the women of the Mallee areas of our State, and especially those who live in the more isolated districts, are wonderful people. On Wednesday, 14th April, the writer was privileged to be present at the Exhibition held at Karte under the auspices of the local Men's and Women's Branches of the Agricultural Bureau.

Karte is a very small township, nearly to the end of the Peebinga line, and its nearest town of any importance is Pinnaroo, 20 miles distant. The farmers of Karte have not had a very encouraging time during the past 5 or 6 years, and it would not be surprising, if after such a depressing period, they and their women folk had lost all interest in organisations of this description. Yet the concensus of opinion of all those who attended, including visitors from Pinnaroo, Parilla, Parilla Well, Murray Bridge, and Adelaide, was to the effect that the Exhibition was a tribute to the wonderful public spirit of these pioneer women.

The residents of Karte have an enviable reputation in that whatever they do they do well, and certainly this, their first attempt at a fixture of this description, was an unqualified success, and one of which many a larger country town might be justly proud.

Mrs. F. N. Atze, an indefatigable worker for Women's Bureaux, has only been resident at Karte for a little over 12 months, but she has welded the women of the district into an energetic and capable band of workers. To her much of the credit for the success of the Exhibition is due. She was very ably supported by Mr. and Mrs. M. E. Small.

One of the farmers said, "This is a red letter day for Karte. We have never had anything like it before, and having been so successful we can confidently anticipate an even better Exhibition next year." In all, 268 entries were received.

Mr. F. C. Richards (Asst. Secretary of the Agricultural Bureau) declared the Conference open, and the following awards were made:—

COOKERY (Judges—Mesdames Young, Mattiske, and Webster, of Pinnaroo): *Loaf of Bread*—1st, Mrs. Freeman; 2nd, Mrs. Freeman. *Yeast Buns*—Mrs. Bierworth, Mrs. H. Gould. *Scones*—Mrs. A. Mattchoss, Mrs. Freeman. *Coffee Cake*—Miss D. Trowbridge, Mrs. Mattchoss. *Ribbon Cake*—Miss G. Fiebig, Miss D. Trowbridge. *Sponge Sandwich*—Mrs. Bierworth, Miss A. Trowbridge. *Chocolate Sponge*—Miss G. Fiebig, Miss E. Atze. *Jam Tarts*—Mrs. H. Trowbridge, Mrs. Atze. *Cream Puffs*—Mrs. C. Gum, Miss A. Trowbridge. *Biscuits*—Miss D. Trowbridge, Mrs. Mattchoss. *Dark Cake*—Mrs. Atze, Miss E. Atze. *Sultana Cake*—Mrs. H. Trowbridge, Mrs. Bierworth. *Small Cakes*—Miss A. Trowbridge, Mrs. Mattchoss. *Pickles*—Mrs. Atze, Mrs.

Mattchoss. *Tomato Sauce*—Mrs. Atze, Mrs. Bierworth. *Chutney*—Mrs. Furness, Mrs. M. Small. *Jam*—Mrs. Atze, Miss E. Atze. *Marmalade*—Mrs. F. Small, Mrs. Mattchoss. *Butter*—Mrs. Button, Mrs. Bierworth. *Eggs*—Mrs. Atze, Miss G. Fiebig.

FRUIT AND VEGETABLES (Judge—Mr. A. F. Young, Pinnaroo): *Collection of Fruit*—Mrs. A. Mattchoss, Mrs. Freeman. *Collection of Vegetables*—Mrs. Atze, Miss Fiebig. *Cucumbers (Apple)*—Mrs. Atze, Mrs. Bierworth. *Cucumbers (Long)*—Mrs. Atze. *Tomatoes*—Mrs. Small, Mrs. Atze. *Rhubarb*—Mrs. Atze, Mrs. Flavel. *Carrots*—Miss Fiebig. *Piemelons* (two sections)—Mrs. Small, Mrs. Button; Mr. M. Small, Miss Fiebig. *Trombones*—Miss Fiebig, Mrs. Small. Marrows—Miss Fiebig, Mrs. Bierworth. *Pumpkins*—Mr. Small, Mrs. Small.

FARM PRODUCE (Judge—Mr. R. L. Griffiths, District Agricultural Instructor): *Wheat*—A. Mattchoss, E. Huckel. *Oats*—A. Mattchoss, A. Bierworth. *Wheaten Hay*—A. Small, H. Gould. *Oaten Hay*—Miss Fiebig, A. Bierworth. *Lucerne*—Mrs. Small, M. Small. *Wheaten Chaff*—H. Gould, A. Mattchoss. *Oaten Chaff*—G. Atze, C. Atze. *Rabbit Skins*—H. Gould, M. Small. *Something Useful Made From Something Useless*—G. Atze, M. Small.

FLOWERS (Judges—Mesdames Johnston, Davis, and Napper, of Parilla Well): *Dahlias*—Mrs. Atze, Mrs. Mattchoss. *Cosmos*—Mrs. Bierworth, Miss G. Fiebig. *Gaillardias*—Mrs. Atze, Miss Fiebig. *Asters*—Miss Fiebig, Mrs. Trowbridge. *Vase of Flowers*—Mrs. Atze, Miss A. Trowbridge. *Sunflowers*—Miss Atze, Mrs. Atze. *Carnations*—Miss P. Button, Mrs. C. Gum. *Roses*—Mrs. Atze, Miss E. Atze. *Zinnias*—Miss Fiebig, Mrs. Atze. *Flower Not Named*—Miss Atze, Miss Fiebig. *Posy*—Miss D. Trowbridge, Mrs. F. Small. *Pot Plant*—Mrs. Atze, Mrs. C. Gum. *Fern*—Mrs. Atze.

FANCY WORK (Judges—Mesdames Welden, Carne, and Miss Colwill, of Parilla): *Bag Apron*—Mrs. M. Small, Mrs. Atze. *Table Centre*—Mrs. M. Small, Miss Atze. *Vanity Set*—Mrs. M. Small, Miss A. Trowbridge. *Cushion*—Miss E. Atze, Mrs. M. Small.

The school children were granted a half holiday, and during the afternoon sports and games were organised for them.

During the evening Mr. Richards handed the prizes to the successful competitors, and a dance and supper concluded a most successful function.

BUREAU EXHIBITION AT PARILLA.

The Fifth Annual Exhibition of Women's Handicrafts, sponsored by the Parilla Women's Branch of the Agricultural Bureau, was held in the local institute on Thursday, 15th April.

This function provided still further evidence of the growing popularity of the Women's Agricultural Bureau in the country districts of the State, and is an example of the co-operation that exists between Branches along the Pinnaroo Line, representatives being present from Wilkawatt, Parilla Well, Pinnaroo, and Karte—35 miles distant.

This year eclipsed all previous records, when 250 entries were received, and to encourage the junior members of the Branch special sections in which they could compete were included.

	First.	Second.
Brown butter sponge	Mrs. G. Harding	Mrs. G. Belling
Cornflour sponge	Mrs. H. Harding	Mrs. Smitham
Sponge roll	Mis. F. Belling	Mrs. Smitham
Sultana cake	Mrs. Welden	Mrs. O'Loughlin
Coffee cake (cinnamon top)	Mrs. Wright	Mrs. R. C. Kerley
Ribbon cake	Mrs. G. Belling	Mrs. R. C. Kerley
Napoleon cake	Mrs. Pearce	Mrs. F. Belling
Six cream puffs (3 filled, 3 unfilled)	Mrs. R. C. Kerley	Miss Colwill
One walnut roll with fruit	Mrs. Welden	Mrs. R. C. Kerley
Biscuits—6 different mixtures (3 of each to be named)	Mrs. Foale	Miss Colwill
Six pieces cut from cake and iced ..	Miss Foale	Mrs. R. C. Kerley
Rich dark cake	Mrs. F. Kerley	Mrs. Smitham
Decorated cake	Miss Foale	Mrs. R. C. Kerley
Collection puff pastry	Mrs. Colwill	Mrs. Pearce
Six jam tarts	Mrs. Foale	Mrs. Pearce
Six sausage rolls	Mrs. Pearce	Mrs. R. C. Kerley
Six white scones	Mrs. R. C. Kerley	Mrs. F. Kerley
Six coffee rolls	Mrs. Wright	Mrs. Foale
One only 2lb. loaf white bread	Mrs. F. Kerley	Mrs. R. C. Kerley
Six bread rolls	Mrs. Pearce	Mrs. Welden
Collection goods made from wholemeal (not bread)	Mrs. Foale	Mrs. Colwill

BUREAU EXHIBITION AT PARILLA—*continued.*

	First.	Second.
Six jars jam	Miss Colwill	Mrs. R. C. Kerley
Four jars preserved fruit (2 cut, 2 whole)	Miss Colwill	Mrs. R. C. Kerley
One glass marmalade	Miss Colwill	Mrs. R. C. Kerley
Three jars chutney	Mrs. R. C. Kerley	Mrs. F. Kerley
Bottle tomato sauce	Mrs. F. Kerley	Mrs. Smitham
Jar mustard pickle (mixed)	Mrs. R. C. Kerley	Mrs. F. Kerley
Jar clear pickle (mixed)	Miss Colwill	Mrs. F. Kerley
Jar pickled onions	Mrs. F. Kerley	Miss Colwill
Three tomatoes	Mrs. R. C. Kerley	Mrs. Colwill
One pound butter	Miss Colwill	Mrs. R. C. Kerley
Two-pound bar soap	Mrs. R. C. Kerley	Mrs. Smitham
Knitted jumper in 4-ply wool	Mrs. R. C. Kerley	Mrs. O'Loughlin
Mrs. R. C. Kerley wins aggregate.		
Collection of dahlias	Mrs. Welden	Mrs. Foale
Dahlias—		
One variety (6 different colours)	Mrs. Welden	
Three varieties (1 of each)	Mrs. Foale	Mrs. Welden
One cut show	Mrs. R. C. Kerley	Mrs. Welden
One cut decorative	Mrs. Schumann	Mrs. Welden
One cut cactus	Mrs. Welden	Mrs. Foale
One cut (not already mentioned)	Mrs. Welden	Mrs. Schumann
Vase of carnations	Mrs. Schumann	Mrs. R. C. Kerley
One cut carnation	Mrs. Schumann	Mrs. Welden
Three cut carnations	Mrs. Schumann	Mrs. Welden
Vase of Gallardias	Mrs. R. C. Kerley	Mrs. Welden
Vase of flowers not already mentioned	Mrs. Schumann	Mrs. R. C. Kerley
Vase mixed flowers	Mrs. R. C. Kerley	Mrs. Welden
One cut bloom not already mentioned	Mrs. Schumann	Mrs. Welden

JUNIOR SECTION.

	First.	Second.
Six white scones	Miss Carman	Miss Foale
Six small cakes (iced) made from one mixture	Miss Foale	Miss Carman
Puff pastry (6 pieces)	Miss Foale	Miss Carman
Supper cloth worked in colours	Miss Carman	
Tray cloth or table centre (worked)	Miss Carman	Miss Foale
Knitted jumper in 3-ply	Miss Carman	

EXHIBITIONS.

WIRRULLA.

A competitive Exhibition was held on 6th February. There was an excellent staging of fancy work, rugs, cushions, cosies and cookery. Misses Dennison and Mrs. F. Burfield, of the Auburn Branch, adjudicated and Miss S. Macklin won the prize donated by Mrs. W. R. Jones for the competitor gaining the highest number of points.

CLARE.

The success which attended the first Exhibition conducted under the auspices of this Branch—held on 7th March—should give the committee every encouragement to give this fixture a place on each year's programme of meetings. Visitors were present from the Belalie and Georgetown Branches. The section devoted to a display of antiques contained many articles of historical interest. The classes for needlecrafts and cookery were well supported, the judges—Mesdames Baily, Orchard and Syms—giving unstinted praise to the high quality of the exhibits placed before them.

NARRIDY.

Women's Branches of the Agricultural Bureau have staged many excellent exhibitions displaying the handiwork of their members, but it is doubtful if the fixture held under the auspices of the Narridy Women's Branch on 7th May, has ever been equalled. This Branch—to celebrate the completion of its first year's work—decided to hold a competitive exhibition of Women's handicrafts, entries to which would be restricted to its members. Under the able direction of Mrs. Klingner (President), Miss Brenda Reynolds (Secretary) and an enthusiastic Committee, the Narridy Women have set a very high standard for other branches if they are rival to them. The wonderful total of over 500 entries was received, and the judges who had had experience at the big agricultural shows in the Mid-North said of the needlework and jams, pickles and preserves classes, that these sections eclipsed both for quality and quantity anything that they had been called upon previously to judge. Twenty-nine entries were received in the class for 1lb. of farm butter. This was judged by Mr. J. O. Hatter (District Dairy Instructor) who confessed to having an extremely difficult task in naming the winner. Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau) opened the exhibition. The judges made the following awards:—

NEEDLEWORK.—Judges, Mesdames F. C. Spottswood and R. E. Lines (Gladstone).

Suppercloth—First, Mrs. W. C. Eagle; second, Miss V. Roberts. *Four Needlework Articles*—Miss V. Roberts, Mrs. W. Eagle. *Worked Cushion*—Mrs Eagle (1 and 2). *Teacosy*—Mrs. Eagle, Mrs. S. Darley. *Embroidered D'Oylies*—Mrs. W. Eagle, Mrs. S. Darley. *Two Tatted Articles*—Mrs. M. O. Smart, Miss L. Roberts. *Crocheted D'Oylies*—Mrs. W. Eagle, Mrs. M. O. Smart. *Embroidered Underwear*—Mrs. W. Eagle, Miss L. Roberts. *Article of Cross-Stitch*—Mrs. W. Eagle (1 and 2). *Worked Apron*—Mrs. Eagle, Miss L. Roberts. *House Frock*—Miss B. Reynolds, Mrs. Frick. *Article made from Sugar Bag*—Miss L. Roberts (1 and 2). *Homemade Rug of Wool*—Miss L. Roberts, Mrs. Eagle. *Homemade Rug other than Wool*—Mrs. W. Eagle, Mrs. R. Darley. *Child's Frock*—Miss L. Roberts, Mrs. M. Smart. *Duchess Set*—Mrs. W. Eagle, Mrs. S. Darley. *Table Centre*—Mrs. S. Darley, Mrs. W. Eagle. *Article made from Material costing not more than* 1s.—Mrs. M. O. Smart, Mrs. W. Eagle. *Embroidered Handkerchiefs*—Mrs. W. Eagle (1 and 2). *Knitted Sox*—Mrs. A. Klinger (1 and 2). *Article of Knitting*—Mrs. M. Smart, Mrs. S. Darley. *Baby's Outfit*—Mrs. L. Nicholson. Trophy presented by Mrs. Button. *Novelty*—Mrs. M. Reynolds, Mrs. W. Eagle. *Unspecified*—Mrs. W. Eagle (1 and 2). *Aggregate Prize*—Mrs. W. Eagle.

NEEDLEWORK SECTION FOR COMPETITORS NOT WINNING A PRIZE.

Doorslip—Mrs. A. Klinger, Mrs. J. Liddle. *Duchess Set*—Mrs. L. Nicholson, Miss M. Liddle. *Table Centre*—Mrs. R. C. Darley, Mrs. P. Smart. *Worked Apron*—Miss B. Reynolds, Miss M. Sandow. *Tea Cosy*—Miss M. Sandow, Mrs. Frick. *Supper Cloth*—Mrs. R. Smart, Miss M. Sandow. *D'Oylies*—Miss M. Sandow. *Crochet Work*—Mrs. L. Nicholson, Miss B. Reynolds. *Knitting*—Mrs. L. Nicholson, Mrs. R. Smart. *Unspecified*—Miss O. Sandow, Mrs. K. Saltmarsh. *Aggregate Prize*—Mrs. Sandow, Mrs. Nicholson.

NEEDLEWORK FOR JUNIOR MEMBERS.

Petticoat—Miss E. Sandow, Miss K. Nicholson. *Worked Apron*—Miss J. Richards, Miss E. Sandow. *Knitting*—Miss J. Richards, Miss E. Sandow. *Table Centre*—Miss E. Sandow, Miss K. Nicholson. *Unspecified*—Miss K. Nicholson, Miss J. Richards.

JAMS, PRESERVES, &c.—Judges, Mesdames H. Osmon and H. Bennett.

Six Jams—Miss L. Roberts (1 and 2). *Four Jellies*—Miss L. Roberts (1 and 2). *Three Marmalade*—Miss L. Roberts (1 and 2). *Six Preserved Fruits*—Miss L. Roberts (1 and 2). *Three Pickles*—Miss L. Roberts (1 and 2). *Three Sauces*—Miss L. Roberts, Mrs. P. Smart. *Three Chutneys*—Miss L. Roberts (1 and 2). *Unspecified*—Mrs. A. E. Klingner, Mrs. M. Reynolds. *One Dozen Eggs*—Miss L. Roberts, Mrs. L. Nicholson. *One Pound Dairy Butter*—Miss M. Sandow, Miss F. Sandow. Trophies presented by Mesdames Reynolds, Eagle and Mr. H. Pavey.

COOKING.—Judges, Mesdames H. Osmon and H. Bennett (Gladstone).

Fruit Cake—Miss V. Roberts, Mrs. J. Liddle. *Decorated Cake*—Mrs. M. Reynolds, Mrs. M. O. Smart. *Sponge Sandwich*—Mrs. K. Saltmarsh, Mrs. M. O. Smart. *Chocolate Butter Sponge*—Mrs. K. Mannix, Mrs. M. O. Smart. *Sultana Cake*—Mrs. M. O. Smart, Mrs. L. Saltmarsh. *Ribbon Cake*—Mrs. A. E. Klingner, Mrs. P. Smart. *Cream Puffs*—Miss M. Darley, Mrs. K. Saltmarsh. *Jam Tarts*—Mrs. C. Cox, Mrs. A. E. Smart. *Lamingtons*—Mrs. L. R. Nicholson, Miss K. Mannix. *Queen Cakes*—Mrs. M. O. Smart, Miss M. Sandow. *Sausage Rolls*—Mrs. A. E. Smart, Mrs. K. Saltmarsh. *Yeast Buns*—Mrs. M. Reynolds, Mrs. B. Reynolds. *Scones*—Mrs. L. Smart, Sen., Miss M. Darley. *Coffee Rolls*—Mrs. P. Smart, Mrs. A. E. Smart. *Nut Roll*—Mrs. A. E. Klingner, Miss M. Price. *Currant Cake*—Mrs. A. E. Klingner, Mrs. M. O. Smart. *Coffee Cake*—Mrs. K. Saltmarsh, Mrs. J. Liddle. *Bread*—Mrs. M. Reynolds, Mrs. E. A. Darley. *Biscuits*—Mrs. M. O. Smart, Mrs. M. Reynolds. *Aggregate Winner*—Mrs. M. O. Smart. Trophies donated by Misses L. Roberts and Messrs. A. W. Dawes and H. Prest.

JUNIORS.

Egg Sponge—Miss E. Sandow, Miss G. Saltmarsh. *Scones*—Miss E. Sandow, Miss D. Smart.

FLOWERS.—Judge, K. R. Hocking, (Crystal Brook).

Antirrhinum—Mrs. A. Freeman, Miss M. Price. *Three Distinct*—Miss M. Price. *One Chrysanthemum*—Mrs. A. Freeman, Miss L. Roberts. *Three Single*—Miss L. Roberts (1 and 2). *Six Japanese*—Miss L. Roberts (1 and 2). *Collection*—Miss L. Roberts (1 and 2). *Cosmos, Single*—Miss A. Freeman. *Cosmos, Double*—Miss M. Price. *Carnation*—Mrs. A. Smart. *Three Show*—Mrs. A. Freeman. *Collection of Carnations*—Mrs. Frick. *Dahlia, Champion*—Mrs. A. Freeman. *Three Decorative*—Mrs. A. Freeman. *Marigolds*—Mrs. C. Cox, Mrs. A. Freeman. *Pelargoniums*—Mrs. A. Klingner, Miss M. Price. *One Rosebud*—Miss M. Price, Mrs. R. Smart. *Three Rosebuds*—Miss M. Price, Mrs. A. Smart. *Rose*—Miss M. Price. *Three Roses*—Miss M. Price, Mrs. A. E. Smart. *Zinnia*—Mrs. L. Nicholson, Miss M. Price. *Three Zinnias*—Mrs. L. Nicholson (1 and 2). *Six Zinnias*—Mrs. L. Nicholson. *Chrysanthemums*—Mrs. L. Nicholson, Miss L. Roberts. *Cosmos*—Mrs. A. Freeman. *Carnations*—Mrs. Frick, Mrs. A. Smart. *Dahlias*—Mrs. A. Smart. *Marigolds*—Mrs. A. Smart, Miss L. Roberts. *Salvia*—Miss M. Price, Mrs. A. Smart. *Verbena*—Miss M. Price. *Gladioli*—Mrs. A. Freeman. *Bowls of Flowers—Yellow*—Miss L. Roberts (1 and 2). *Red*—Miss L. Roberts (1 and 2). *White*—Miss L. Roberts, Mrs. A. Smart. *Blue*—Mrs. A. Smart. *Stocks*—Miss M. Price. *Geraniums*—Miss M. Price, Mrs. A. Klingner. *Roses*—Mrs. A. E. Smart. *Antirrhinum*—Mrs. Frick. *Dahlias*—Mrs. L. Nicholson (1 and 2). *Chrysanthemums*—Miss L. Roberts Mrs. A. Freeman. *Zinnias*—Mrs. L. Nicholson, Mrs. A. Smart. *Cut Flowers*—Mrs. A. Smart, Miss M. Price. *Unenumerated*—Mrs. A. Freeman, Mrs. A. Smart. Trophies presented by Mrs. L. Nicholson and Mr. Burns. *Aggregate Prize*—Miss L. Roberts.

HANDMADE GARMENT.

Unspecified—Miss K. Nicholson, Miss G. Saltmarsh. Trophy donated by Mrs. A. Smart. In the evening, Mr. Richards presented the trophies, and a most successful day was concluded by a Supper and Dance—the music for which was supplied by members from the Beetaloo Women's Branch of the Agricultural Bureau.

NEW BRANCH AT OWEN.

A new Women's Branch of the Agricultural Bureau was opened at Owen by Mr. F. C. Richards (Asst. Secretary of the Agricultural Bureau) on 28th April. The following officers were elected:—President—Mrs. W. J. Marshman; Vice-President—Mrs. H. Helps; Secretary—Miss M. Lake; Members of Committee—Mesdames J. Williams and H. Moeller. Meetings will be held in the Methodist Kindergarten Hall on the second Thursday of the month, at 3 p.m.

MORCHARD.

The committee of the Women's Branch of the Agricultural Bureau at Morchard, and especially the Secretary, Miss F. Brown, deserve very sincere congratulations for the success which attended their efforts in staging their first competition of cooking and women's handicrafts which took place in the local institute on 25th March. With 161 entries to record on the occasion of their first attempt at a function of this description, they have been given every encouragement to conduct a similar fixture next year. Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau), who opened the show, said he knew of no better method of stimulating interest in Bureau work than the holding of such competitions. They served as an excellent advertisement for the Bureau and aroused friendly rivalry amongst those who took part. The judges of the various sections were agreeably surprised at the quality of the work placed before them, and it is worthy of special mention that Mr. Birrell, manager of the Orroroo Butter Factory of the Farmers' Union, said that the class for home-made butter was of exceptional merit. Many of the butters were equal in texture and quality to what one would expect to see produced during the spring months of the year. Mrs. Symonds, of Jamestown, judged the pickles, jams and sauces. She confessed that the high standard of the exhibits was an eye opener to her and her task had been anything but an easy one. The pickles could, with confidence, be shown at any show. The scones were the outstanding class in the cookery classes judged by Mrs. Pyne of Jamestown. The d'oyleys and supper cloths were highly praised by Mrs. E. L. Orchard, who was the adjudicator for the needlework section. The thanks of the committee are extended to the following who generously donated trophies:—Wepowie Branch of the Agricultural Bureau, Mr. S. Brown, Orroroo Cash and Carry, H. P. Davill & Co., South Australian Farmers' Union, Laura Milling Company.

SPONGE AND LAYER CAKES.

Reading a paper "Hints for Cooking Sponge and Layer Cakes" at the March meeting of the Maltee Branch, Miss R. Talbot said before baking is commenced have everything required handy and tins, &c., lined and greased. Use fresh eggs; they seem much lighter when well beaten, and a successful sponge depends greatly on the lightness of the eggs and sugar when beaten. Add each egg separately to the sugar and beat a few moments before adding the next egg. Nearly all layer cakes require butter, which should, of course, be beaten to a cream with the sugar before the eggs are added (unless stated differently in the recipe being followed). If a warmed basin is used, the sugar and eggs will mix more quickly and more thoroughly, which is a very important item. Beat the eggs and sugar for 10 minutes to quarter of an hour, and by that time the mixture is usually light and fluffy.

The flour and rising should be gradually folded in and mixed well, but not beaten vigorously. Plain flour, cream of tartar, and carb. soda with a little salt, are more successful than self-raising flour, and when sifted twice the cake should be finer in texture. A heaped teaspoon of cream of tartar, half teaspoon carb. soda, and pinch of salt to every cup of flour are the quantities I always use with success.

The prepared mixture should be poured into the sandwich tins (previously prepared), which should have the sides high enough to allow the mixture to rise sufficiently. Grease the tins well with a little lard or unsalted butter and dust with flour, so that the cakes will turn out easily without sticking.

A fairly hot oven is required for sponges, but as layer cakes nearly all contain butter, a moderate heat should be used. When testing a sponge to see if cooked (after being in the oven as long as recipe states), press lightly with a finger, and if sufficiently cooked, the imprint will quickly rise again. This is much better than piercing a hole in the top of the cake. The paper concluded with a number of recipes. (Secretary, Mrs. J. Ferguson.)

JAMS AND PICKLES.

In the course of a short paper, read at the February meeting of the Myponga Branch, Mrs. W. Magor said when making pickles it is most important to use good vinegar. Vinegar boiled with spices, cooled and poured over onions, makes good, crisp pickles, which retain their colour. For mustard pickles, the ingredients must be brought to the boil in vinegar to soften and boiled until one can pierce with a carving fork

The success of jams depends on the fruit used. Over ripe fruit does not make good jam. Firm fruit is best for jams and preserving. Marmalade is more trouble to make, but is a better jam for the extra trouble. Poorman's orange is the usual fruit for marmalade. Of late years grape fruit has taken its place. The jam competition was won by Mrs. Bounds with Mrs. Deverson second. (Secretary, Mrs. M. Bounds.)

WOMEN AND PUBLIC AFFAIRS.

At the Devlin's Pound meeting, held on 25th February, the following paper was red by the President, Mrs. S. A. Smith:—History speaks with no uncertain voice of the power of woman to command the admiration and mould the character of the age in which she lives. She has swayed the policy of nations and changed the map of the world; she is the most powerful factor in the changing story of humanity.

It is not the King on the throne, or the President in the White House, or the statesman with his logic and eloquence, or the soldier with laurels of military glory who controls this world—it is the women.

As we follow history down the ages we find many women of Biblical times taking very active part in the public affairs of those days. Sometimes their activities were for evil, but more often they were for the good of their people.

There have been our own English Queens, particularly the famous Elizabeth, who was very much in public affairs since she was a woman who knew her power, and used it to the utmost. Queen Victoria's long reign was noted for reforms, in many of which women took an active part.

Many great reforms of the past have been effected by women. We remember Florence Nightingale as the woman who, in face of tremendous difficulties, went to the battlefields of the Crimean Peninsula, and, with a loyal band of helpers, set an example of devotion to suffering humanity. Elizabeth Fry, who died nearly a century ago, made prison reform the object of her life. At that time men, women, and children were imprisoned under the most awful conditions. Through Mrs. Fry's work and influence. prison life in England was completely revolutionized. Mrs. Fry, also Mrs. Pankhurst, spent her life and money in working to gain the vote for the women of England Harriet Beecher Stowe, by her writings, did much in the cause of the abolition of slavery in America.

To come to our own day, and our own country, we find many women holding public positions—more than ever before. There are women lawyers, doctors, justices, heads of various departments, and women frequently sit on the bench of law courts. There are many women's associations which are doing excellent work, especially in matters affecting women and children, and surely in such matters there is none so qualified to give an opinion as women.

In advocating the taking of a share of public life it is not suggested that it should be taken in the spirit of rivalry between the sexes, but so far as possible in conjunction, for in the cause of humanity man's cause is woman's. To-day there is public work as perhaps never before, and, in women's cause, union is strength. There are the wrongs of women and children to be righted, there is unemployment, poverty, and crime to be contended with. What do women want? Is it knowledge, civilisation, the good of mankind? We must look facts in the face—we must do our part, each in making the world over—the brave new world of reason. The pen is mightier than the sword. Speech, written or spoken, is the main method of reaching the public mind. Women to be masters of their fate must speak and contend for their rights and their point of view.

The average country woman has just as much sense, wisdom of real life, and more courage to face its bad weather, emergencies, and hardships as the average city woman. We must get out of the habit of being victims of modesty and silence. In matters that affect us we must get into the habit of talking back, if it is only through the daily paper, and compel the attention and fire the imagination of those in authority with a sense of what we need and what we deserve. Remember that country women, the women of the land, have held the world together in peace and war, and they go down to their graves unhonoured and unsung, because they lacked the endless use of their tongues in public life.

Do you feel that your district has any needs? Are you satisfied with local conditions as they are? Do you think you and your children are getting equal consideration with city women and children? Do you ever compare your children's school and school life with that of children in the city? Do you compare our roads with city roads? Do you sometimes think of the frequent cheap excursions from the city to the hills and to the beach? Do you also think of the health clinics and the many advantages city people have? Do you think of their cheaper living, and our freight and transport problems? If you feel any of these things, it is time you became a woman of public affairs. From the little matters of our own district we move on to matters of State interest—we keep working for greater things: Strong souls and high endeavour, the world needs them now.

We have local committees, school, hall, and Bureau—just one idea of yours may work untold good. You may not see the fruit of your work; someone else may reap the harvest of it—that is no reason the work should not be done. If you are animated by the right spirit you will do it for the joy of the work. The Governor-General often said, while our State Governor, "Service is the rent we pay for our room on earth." Often one may get discouraged and despondent with the seeming lack of results, but there never shall be one lost good. There is no standing still in life, if we are not going forward, we are going backward. Public life takes more moral courage than physical courage; but it will grow on you, and your enthusiasm will grow also. Do not be afraid of your enthusiasm—turn it to account. You will be laughed at some times, but you will also be watched with interest. In practically every country in the world women are active in public affairs, not for the sake of glory, but in the great cause of mankind, in the betterment of the world. (Secretary, Mrs. J. Loffler.)

HOME CRAFTS.

Mrs. H. Queale read the following paper at the March meeting of the Boor's Plains Branch, which was attended by 15 members and five visitors:—Most women have a hobby on which to spend their spare moments—be they many or few—and try to make their hobby useful and profitable as well as a pleasure. With the aid of a packet of dye and scraps of cretonne or other coloured cloth, many attractive articles can be made from hessian or sugar bags. One of the easiest ways to dye the bag or hessian is by immersing them in a solution of Condy's crystals. They must be washed and placed in the liquid whilst wet, and according to the strength of the solution so will their colour be light or dark. Many shades from a golden brown to nigger brown are obtainable this way, and it is well to remember that the article is always a lighter shade than when wet. Stir the bag round in the liquid until it has absorbed as much dye as possible and then hang out to dry, when it is ready for use.

Oven cloths and aprons for outside work can be made from the sugar bag. Relieved with a binding of gaily coloured cretonne they are quite attractive. Peg bags made of the same material and with an ordinary coat hanger inserted in the top are very useful. These can be hung upon the line and pushed along as required. For those who like to rest their feet when sitting, reading, or serving, a stool can be made with seven tins—all the same size—and covered with the dyed bag. The tins are placed together in a six-sided figure and tied securely. Any old scraps of material can be pushed down between them and thus prevent any movement. Two cardboard circles the same size as the tins are then cut and one placed under and one on top of the tins. Two circles of material are then cut, allowing turnings, and one long strip for the outside of the tins. One circle and the strip can be sown together, and the tins placed inside, and then the other circle is sewn over the top. A padding can be made for the top with sheep's wool washed and teased. This is very soft and "springy." The seams can be covered with a cord or piping of coloured material. If the latter is used it should be sewn on at the same time as the circles. The wool also makes excellent filling for cushion covers, which can be made from dyed hessian and worked in a bold design in wool or raffia, and are very useful on the verandah furniture or for rough usage.

I have a very useful cloth for the kitchen table and curtains for the boxes I use for cupboards made from hessian which I dyed with Condys and trimmed with cretonne. The hessian being of a fairly open weave tends to suggest some other material than just plain "bag."

Small mats to stand the teapot or other hot dishes upon are made from binder twine and raffia. The raffia is wound round and round the twine and formed into a circle, each round being attached to the previous one by winding the raffia round both at once—at regular intervals.

A useful little whisk for the fireplace can be made from hay bands. The twine can be coloured if desired.

For the making of floor rugs, cushions, &c., from wool and old materials there are many devices. One called "Singercraft" is attached to and used on the sewing machine. If the wool is wound thickly around it the pile sits out instead of lying over as with materials. It is very useful for using up odd scraps of wool.

The "Jewel" needle makes very effective cushions. Finer wool and artificial silk may also be used. Flannel or velour is best for the foundation, as it grips the thread. It is best to have a neutral shade for the background. Clippings are used for cushion fillings. A very effective style is to use two corks on needles and so make short pile or loops. If the material is painted lightly on the wrong side with shellac or thin lacquer, there is no chance of the threads pulling through. Mrs. Queale exhibited samples of each of the articles described. (Secretary, Miss L. Stanway.)

DRESSMAKING.

Miss T. Barnett contributed the following paper at the February meeting of the Laura Bay Branch:—Every girl and woman should be able to do her own dressmaking. Those who are not naturally gifted in this direction are wonderfully catered for by pattern books. The two essential points to remember are accuracy in measurement, cut and fit, and neatness in making, finishing, and pressing.

It is most important that the home dressmaker should know how to take measurements accurately. Not knowing the correct way often results in waste of good material. (1) Neck measurement: Place inch tape round lower part of neck without straining tape. (2) Bust: Place inch tape round body, keeping tape well up under the arms. The tape falls fairly straight across back and lowers slightly in front across fullest part of bust. (3) Length forearm: From where sleeve meets armhole of blouse to wrist. (4) Waist line: Fairly firm around waist of body. (5) Hips: 6in. below waist line, allowing tape slack enough to pass two fingers underneath. (6) Seat: 10in. below waist line, allowing tape slack enough to pass two fingers underneath. (7) Length skirt front: Waist line to length required. (8) Length side skirt: Waist line to length required. (9) Length skirt back: Waist line to length required.

When using a bought pattern, the safest way for the inexperienced worker is to pin all parts of the pattern together and slip it on, making any alterations that seem necessary. If altering the pattern, always remember that the outline of the pattern must not be altered, work from the outside. After the alterations have been made to fit the individual measurements, pin the pattern on the material that has been prepared previously. For cutting out, chalk or tailor tack around the outline of the pattern. When pinning the pattern on the material be sure that the grain of the material all runs one way, otherwise the garment will pull out of shape when finished. Careful cutting makes a wonderful difference to the appearance of a finished garment. When placing the garment together, baste all seams before machining. The flat seam is popular and simple, and is made by joining two pieces of material together right sides facing. This seam must be done neatly—except when under a lining—by clipping or overcasting. For flimsy materials use the French seam, made by machining two pieces of material together on the right side, then on the wrong.

The fitting of the frock is very important. Sleeves are often a worry—never make two sleeves for the same armhole. To determine which sleeve goes into the right armhole, place both sleeves on the table with the seams opposite each other and the under facing up; then each sleeve is for the arm it is in front of. To set in the sleeve, place the seam of the sleeve about 2in. to 2½in. towards the front of the underarm seam of the blouse. This acts in most cases, unless the sleeve is a seam to seam sleeve, then it is placed seam to seam.

If shoulder darts or pleats are used, they should not run with the grain of the material, but with the sleeve line. The turning of a hem should be done invisibly by hand. To do this take a few threads, then insert the needle into the turned hem, pass along about ¼in. before bringing out in the usual way. For finishing off neck and sleeve openings, always cut the material on the bias. (Secretary, Miss T. Barnett.)

NEEDLECRAFT.

Paper read by Miss H. Watt at the March meeting of the Wirrabara Branch, which was attended by 23 members and 14 visitors.

Needlecraft is a homely craft that is practised almost every day, even the sewing on of buttons, or of mending rents, but these are not sought after too willingly. The busy housewife usually soon tires of it—especially women on the land when such work has to be done after the day's work is completed. Even the putting on of patches is an art. How nicely they can be done, and how awkwardly, too. Some patches need a degree of patience to accomplish the task satisfactorily, blending of mending materials, cotton, &c., correctly. Many a tear can be mended so well as to be hardly seen, even when examined closely—by unravelling a thread from the edge of the material and darning it neatly and finely. Our grandmothers and great grandmothers would say this is, coupled with the making of our garments, the main member of the huge needlecraft family, and practice it in our everyday life. It is wise for us to develop our interest in this quarter and not let laziness handicap us in this very necessary craft. Once this is mastered and we are able to make our own garments successfully, then is the time to look for something in the lighter and finer line of stitchery.

KNITTING.

Every young girl should be taught to knit, even if only in a very simple way, by doing plain and purl. Later she will be able to fashion something nice even from this form of knitting. Knitting does not call for so keen an eyesight as fine embroidery or crochet work. Experienced workers with the knitting needles appear to be able to knit quite quickly without looking at their work. Many hours can be passed in this way. The knitting of woollen jumpers, cardigans, singlets, baby clothes, &c., of wool should be encouraged not only because they are so warm and soft during winter and also useful, but it is building up the wool industry, which all Australians should endeavour to do. The buying of Australian made wools not only helps the agricultural community, but gives employment to many hundreds of men and girls. The knitting of home made garments has been practised only for the past 18 to 20 years, and has been the means of developing a vast volume of trade in the manufacture and trade of the woollen yarn.

During the great war knitting came to the fore. It was taught in schools to both boys and girls in many country centres.

At the present time any energetic young lady can have several lacey jumpers and cardigans at a small cost. A jumper I made two years ago has been washed several times, and the wool cost only 1s. The following recipe is ideal for washing woollies:—Two tablespoons of soft soap and one of borax to a pail of water. Put the woollens in very cool water and soak for two hours. Rinse in two or three waters of same temperature, avoid rubbing and do not wring, but squeeze out and dry away from the rays of the sun.

Knitting is also done in silks and cottons, and some charming garments are made, such as jumpers, sox, frocks, scarves, &c.

Needles.

Size 12 needle use 2 ply.
Size 10 needle use 3 ply.
Size 8 needle use 4 ply.

If one is a tight knitter use a size larger needle, and if a loose knitter a size smaller. For small children's clothes use a No. 10 needle for 2 ply; these garments need so much laundering that they soon become closer.

If the knitter has not a tried out pattern for a jumper, try working to a paper pattern or test the working by putting 20 stitches on a needle and working 2in. If this is measured it will give the number of stitches to the inch. Then it is possible to reckon how many stitches to the required number of inches. For singlets use large needles and work them in 2 ply wool. For these loose, open work patterns are preferred, because perspiration and heat shrinks singlets more than laundering. A No. 6 needle is suitable for the work, and once home knitted woollen singlets are worn for winter the bought article will not be purchased.

Second grade wool can be put to many uses—for boys' jumpers and girls' school clothes it is much better, the garments do not shrink so much and they stand up to hard and rough wear. Men's sox also wear much longer if made from the poorer grade wools.

Miss Watt, in order to more clearly explain the merits expressed in her paper, exhibited a fine collection of needlecraft, and kindly offered to show any of her listeners how the various stitches and designs were made. (Secretary, Mrs. E. Harding.)

CHICKEN RAISING.

At the March meeting of the Pinbong Branch, Mrs. F. Rehn read the following paper:—From now on until August is the best time to rear chickens for winter eggs in this part of South Australia. Early chickens receive the green feed that is so necessary for building up their constitutions and this—to develop a strong and healthy bird—is the first essential to plenty of eggs.

First select four of the best two or three year old hens and one good cockerel—preferably a two year old bird. Pen these up and use only their eggs. Be sure and feed plenty of green feed, with liberal ration of grain, shellgrit and stove ashes, and give fresh water daily. After the first week, start saving the eggs and when 10 have been laid, set these under a reliable hen. Turn the eggs each day whilst keeping them, and do not store in too cool a place.

When the chicks are hatched, place them in a pen with their mothers and keep them locked up for a couple of days, carefully looking after them. Then let them out and feed them on broken wheat and screenings. By this method it is possible to raise healthy and robust pullets and cockerels. (Secretary, Miss D. M. Scholz.)

SNOWTOWN BRANCH.

The Snowtown Women's Agricultural Bureau held their first meeting for 1936 on 5th March. The Vice-President (Mrs. A. Andrews) presided over a large attendance. The Secretary (Mrs. A. Hocking) read several greetings from various Branches. Mesdames T. Jenkins and P. H. Wheaton took charge of the meeting and gave very instructive papers on "Cake and Biscuit Making." These ladies also arranged a "Favourite Recipe" Competition. Winners of the prizes were:—Best decorated cake, Mrs. A. V. Wallington, Mrs. A. M. Robertson; small cakes, Mrs. L. V. Hancock; biscuits, Mrs. G. Herbert, Mrs. R. Grigg. The recipes were sent with each entry. A Kitchen Competition was won by Mesdames A. Dyer and J. E. Pridham.

DAHLIA SHOW AT McLAREN FLAT.

The fourth annual dahlia show and cooking competition organised by the Women's Branch of the McLaren Flat Agricultural Bureau was opened in the local Soldiers' Memorial Hall on 21st March by Mr. F. C. Richards (Assistant Secretary, Agricultural Bureau). Although entries in the flower section were not so numerous as last year, Mr. R. G. Bennetts, who adjudicated, said the blooms were a marked improvement on those exhibited in 1935, especially in the decorative dahlia class. The champion flower of the show, the Charm Dahlia "Sunshine," tabled by Mrs. R. Elliott, was a bloom of outstanding quality. Mesdames Robertson and Sauerbier, judges of the cooking section, said the entries were of exceptionally high standard, and it was most difficult to select the winners; the fancy cakes being deserving of special mention.

USEFUL HINTS FOR THE HOME.

The following were given at the 6th February meeting of the Auburn Branch:—To remove coffee stain from a tablecloth, pour boiling water over it while the stain is fresh; if it has dried, soak in glycerine and water. To remove iron rust from cotton goods, rub well with salt and lemon and hang on line. What is the cause of butter being streaky and how to prevent? Butter should be mixed well when washing to prevent it being streaky; salt it and mix well before washing it, then wash in several waters until the right flavour of salt is obtained. To keep onion pickle white, peel with a silver knife, use white vinegar, and add a little alum. Why do not green tomato pickles keep? The vinegar may be faulty. Keep airtight and use plenty of liquid. To give glassware or crystal a brilliant polish, wash in soapy water or add a little cloudy ammonia to the water and polish well. What will get rid of bull ants? Waste oil put over the holes where they nest drives them away. A good cure for foot ache:—Bathe the feet in hot water and methylated spirits, or methylated spirits and glycerine mixed in equal parts and rubbed well in will give relief. Castor oil rubbed well into the soles of feet is also good. (Secretary, L. J. Dennison.)

SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			WOMEN'S BRANCHES.	
Kybybolite	10/3/36	10	"Labour-saving Devices"	Mrs. W. D. Kekwick
Hope Forest ...	2/4/36	13	Social Afternoon	Miss M. DeCaux
Rendelsham ...	1/4/36	9	"Jams, Jellies, &c."—Miss I. Campbell	Mrs. W. Bignell
Balumbah......	1/4/36	8	Discussion	Miss H. Jericho
Penola	1/4/36	35	"Fancy Work"—Miss A. Marks	Mrs. F. J. Kidman
Sheoak Log	2/4/36	32	"Cutting up Meat"—Mr. Hewitt	Miss K. M. Koch
O'Loughlin	5/3/36	10	"Decorating a Cake"—Mrs. A. Kloeden	Mrs. E. E. Lutz
O'Loughlin	2/4/36	11	Madeira Cake Competition	Mrs. E. E. Lutz
Laura Bay	10/3/36	9	"Jam Making"—Mrs. E. Lowe	Miss T. E. Barnett

Summary of Reports Received—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		Women's Branches—*continued.*		
Mudamuckla ...	18/3/36	10	" Vegetable Garden "—Mrs. A. C. Watson	Mrs. C. Kuklmann
Wilmington	9/4/36	43	" Quilting "—Mrs. E. L. Orchard	Mrs. P. Cole
Maltee	2/4/36	10	" Rug Making "—Mrs. Ellis	Mrs. J. A. Ferguson
Saddleworth ...	7/4/36	7	Owen Conference Report	Miss G. E. Frost
Pinnaroo	3/4/36	18	" Casserole Cookery "—Secretary	Miss N. A. Mattiske
Coonalpyn	1/4/36	11	" Kitchen Gardens "—Mrs. Fox and Mrs. C. T. George	Miss E. E. George
Devlin's Pound .	24/3/36	18	" Household Hints "—Mrs. J. L. Loffler	Mrs. J. L. Loffler
Mundalla	31/3/36	15	Address—Miss E. Campbell	Miss M. Fisher
Tantanoola	6/4/36	—	Address—Miss E. Campbell	Mrs. Gus Altschwager
Tantanoola	1/4/36	—	Question Box	Mrs. Gus Altschwager
Belalie	14/4/36	24	Address—Mrs. P. A. Ohlstrom	Mrs. E. L. Orchard
Warramboo	3/4/36	10	Jams and Pickles	Miss J. P. Patterson
Clare	4/4/36	34	" Fruit Bottling "—Mrs. and Miss Blight	Mrs. A. Pollock
Echunga	1/4/36	14	" Wreath and Bouquet Making "—Mrs. Hampton	Mrs. F. Dennis
Coonawarra	3/4/36	23	Address—Miss E. Campbell	Miss O. Lear
Coonawarra	15/4/36	36	Handicraft Exhibition ..	Miss O. Lear
Kangarilla	16/4/36	7	Question Box	Mrs. C. Steer
Wasleys	16/4/36	20	Address—Miss E. Campbell	Miss G. Harding
Mudamuckla ...	8/4/36	12	Household Hints	Mrs. C. Kuhlmann
Pinbong	4/4/36	15	" Pot Plants "—Mrs. Davies	Miss D. Scholz
Parrakie	22/4/36	14	" Dyeing "—Mrs. C. Hancock	Miss J. Halliday
Warcowie	7/4/36	5	" Gardening "—Mrs. N. Crossman	Mrs. A. G. Avery
Balhannah	22/4/36	20	" Music "—Mrs. A. S. Kelsey	Mrs. D. A. Camp
Boor's Plains ..	2/4/36	17	" Managing the Household "—Miss T. Reid	Miss L. Stanway
Yandiah	15/4/36	37	" Rug Making "—Mrs. Neale	Miss V. Keller
Laura Bay	14/4/36	12	" Fancy Stitches "—Mrs. R. W. Burke	Miss T. Barnett
Gladstone	21/4/36	40	" A Trip through Yorke Peninsula "—Mrs. Sambell	Mrs. L. J. Sargent
Beetaloo Valley	13/4/36	14	" Music in the Home "—Miss I. Pearce	Mrs. E. A. Pearce
Snowtown......	2/4/36	18	" Bacon Curing "—Mrs. A. Dolling	Mrs. A. Hocking
Myponga.......	21/4/36	9	" Dressmaking "—Mrs. Summers ; " Rug-making "—Miss D. Baxter	Mrs. M. Bounds

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All communications to be addressed:

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, 1936.

Eyre's Peninsula (West), at Ceduna (O'Loughlin Branch), Wednesday, 1st July (Mr. E. R. Pfeiffer, Ceduna).

Upper North, at Eurelia, Wednesday, 15th July (Mr. E. S. Wall, Eurelia).

Murray Lands (West), at Karoonda (Yurgo Branch), Tuesday, 21st July (Mr. H. M. McKenzie, Yurgo).

Pinnaroo Line, at Pinnaroo, Thursday, July 23rd (Mr. H. L. Badman, Pinnaroo).

Eyre's Peninsula (East), at Kimba (Kelly Branch), Tuesday, 4th August (Mr. F. R. Illman, Box 64, Kimba).

Southern, at Inman Valley, Thursday, 20th August (Mr. S. F. Hacklin, Inman Valley).

Hills, at Cherry Gardens, Thursday, 27th August (Mr. A. R. Stone, Cherry Gardens).

Murray Lands (East), at Alawoona, Tuesday, 6th October (Mr. Angus Thomson, Alawoona).

Eyre's Peninsula (Central), at Minnipa, Friday, 23rd October (Mr. H. E. Broad).

Fruit (non-irrigated), at Greenock, Tuesday, 3rd November (Mr. A. Schubert, Greenock).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Pruning Competitions.

River Murray Branches—

Berri, 23rd June.
Barmera, 24th June.
Moorook, 25th June.
Cadell, 30th June.
Waikerie, 1st July.
Mypolonga, 6th July.
Championship at Mypolonga, 7th July.

Lower North—

Greenock, 19th June.
Watervale, 22nd June.
Lyndoch, 4th June.
Williamstown, 26th June.
Koonunga, 30th June.
Light's Pass, 1st July.
Lone Pine, 3rd July.
Championship at Greenock, 9th July.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Northern Yorke Peninsula, Field Trial and Show—Bute, Wednesday, 26th August.
Saddleworth, Saturday, 19th September.
Wudinna, Wednesday, 23rd September.
Waikerie, Saturday, 26th September.
Balaklava and Dalkey, Saturday, 26th September.
Eudunda, Wednesday, 30th September.

Laura, Wednesday, 30th September.
Kapunda and Light, Saturday, 3rd October.
Wirrulla, Saturday, 3rd October.
Burra Burra, Saturday, 3rd October.
Karoonda, Wednesday, 7th October.
Murray Bridge, Thursday, 8th October.
Blyth and Kybunga, Saturday, 10th October.
Loxton, Wednesday, 14th October.
Kimba, Wednesday, 14th October.
Colton, Wednesday, 14th October.
Penola, Wednesday, 14th October.
Strathalbyn, Wednesday, 14th October.
Tailem Bend, Saturday, 17th October.
Mannum, Saturday, 17th October.
Paruna (Brown's Well), Saturday, 17th October.
Maitland, Wednesday, 21st October.
Pinnaroo, Wednesday, 21st October.
Mount Gambier, Wednesday and Thursday, 21st and 22nd October.
Willunga, Thursday, 22nd October.
Clare, Saturday, 24th October.
Port Elliot, Saturday, 24th October.
Kingston (South-East), Saturday, 24th October.
Minlaton (Central Yorke Peninsula), Wednesday, 28th October.
Tatiara (Bordertown), Wednesday and Thursday, 28th and 29th October.
Yankalilla, Saturday, 31st October.
Millicent, Saturday, 31st October.
Mount Barker, Saturday, 7th November.
Woodside, Saturday, 14th November.

Pork Trade.

Writing from London on 14th May, the Agent-General and Trade Commissioner for South Australia (Mr. C. F. G. McCann) states that inquiries are in existence for June-July shipments of South Australian pork, at prices that will probably show a profit to breeders. The demand for Australian and New Zealand frozen pork is a growing one, and each month one notices that gradually the deliveries are becoming standardised in type, though varied in breeding. Preference is in evidence in inquiry and demand for white and chestnut-haired pigs, whose outward appearance, when hung on hooks at Smithfield, is decidedly more attractive. Possibly this will be minimised when greater proficiency in scalding black-haired carcasses is attained. The maintenance of uniformity in the heat of scalding water is imperative, otherwise shaving is bound to depreciate the appearance and value of the carcasses. The Danes, Lithuanians, Canadians, and Argentinians all use cleaning machines and singers and, in consequence, the pork and bacon have a greater appeal to the eye of the buyer, though in actual flavour of meat, either cured or fresh, our pork compares more than favourably.

Tariff Changes.

The Tariff proposals tabled in the House of Representatives provide for the following duties on lubricating oil:—The British preferential duty on mineral lubricating oil is reduced by ½d. per gallon; the new intermediate rate will be the same as the existing general rate; and the general rate will be increased by 1½d. per gallon. The new rates are:—

British	3½d. per gallon
Intermediate	4½d. per gallon
General	6d. per gallon

The increase in the general tariff is intended to give scope for treaty making.

Our Wheatgrowing Areas—Profitable and Unprofitable.

On page 1208 (first paragraph) of the article by Professor Perkins on "Our Wheat Growing Areas—Profitable and Unprofitable" the reference to the county should be Albert and not Alfred. The corrected paragraph is as follows:—

> In county Albert, which lies to the east of county Alfred and is partly within and partly without Goyder's Line, there were eight Hundreds out of thirteen which averaged less than 6bush. per acre in the 20 year period under consideration, namely:—Bakara (5.83bush.), Bandon (5.56bush.), Cadell (5.04bush), Holder (4.76bush.), Mantung (5.40bush.), Moorook (5.45bush.), Paisley (5.75bush.), and Waikerie (4.54bush.), all of which lie outside the line and do not appear to have justified themselves as Wheat growing hundreds. Of the hundreds lying outside the line Murbko above had a mean yield of 6bush. or over, namely, 6.52bush. per acre.

Urrbrae Agricultural High School.

The Urrbrae Agricultural High School which was recently visited by members of the Advisory Board of Agriculture is built on land made available by the late Mr. Peter Waite, near the terminus of the Fullarton car line.

Situated at the foot of the hills, with the Waite Research Park on one side and in ample grounds of its own, its surroundings are favourable both as regards health and opportunities for agricultural development.

At present it is a day school, but the Fullarton car is convenient, and good boarding accommodation can be obtained in the vicinity.

A general education is provided in addition to Agriculture, the curriculum including the following subjects:—English, Mathematics, Arithmetic, Bookkeeping, Botany, Chemistry, and Agriculture (Latin if needed). Students are encouraged to sit for the Public Examinations on the above subjects. Special pains have been given to planning a course suitable for a lad who desires to become a primary producer, and students are encouraged to go on to Roseworthy College.

The Agricultural course includes the study of Crops, Animal Husbandry, and Farm Mechanics. In the school orchard and plots there are opportunities for pruning, spraying, and other practical work. The land available for school experiments is about 30 acres.

Valuable assistance is obtained from the Waite Research Institute which adjoins the school, and visits are made to places of agricultural interest. Pruning, milk testing, and stock judging are important features of the course of instruction.

Evidence that the school is providing a suitable education for country lads is the fact that the attendance is steadily growing, and the following widely-separated centres are represented by scholars:—Kangaroo Island, Willunga, Wynarka, West Coast, Yorke Peninsula, Snowtown, and Millicent. These lads board in the neighbourhood of the school, and others travel to and fro daily by service car from the Hills and other districts.

Imperial Fruit Show.

The Imperial Fruit Show and Canners' Exhibition will be held in Renshaw Hall, Liverpool, on October 30th-November 7th, 1936. The classes open to competition by Australian exhibitors include citrus fruits, apples, canned fruits, and honey. Except where exhibits are to be drawn from stocks held in the United Kingdom, citrus and canned fruits classes, all entry forms and fees must reach the office of the Department of Commerce, Canberra, by August 22nd. Amounts so remitted should include the cost of remitting such fees to London at the current rate of exchange. Oranges and grapefruit are to be judged in London on July 21st and 22nd.

The Imperial Fruit Show offers to Australian producers a good opportunity to demonstrate the high quality of their products, and in past years Australian exhibitors have achieved marked success at this show.

A copy of the prospectus is available for inspection in the library of the Department of Agriculture.

Production of Butter and Cheese.

The following returns show the production of butter and cheese in South Australia since December 1st, 1935:—

1935.	Butter. Lbs.	Cheese. Lbs.
December	1,642,062	807,281
1936.		
January	1,436,611	576,797
February	1,042,250	444,820
March	879,379	411,593

AGRICULTURAL INQUIRIES.

[Replies supplied by W. J. Spafford, Director of Agriculture.]

Viability of Seed Wheat.

Sutherlands asks:—"What is the annual decrease in the germinating power of stored Seed Wheat."

Reply—Wheat Seed varies a good deal as to its length of life according to variety, season, soil, and other factors. Sometimes a sample will retain a high germinating power, of say 90% or over, for 7 or 8 years, and then the percentage of grains capable of germinating will get less very rapidly, whilst other samples gradually lose their germinating power year after year for 9 or 10 years. Occasionally a sample will contain a few grains that might live for 20 years or so, but most grains in practically all samples die within 10 years. An instance taken from the records of the Danish State Seed Testing Station, where the life of most of the important Agricultural seeds has been tested, shows the life of wheat seeds to be:—1st year, 92% germination; 2nd year, 95% germination; 3rd year, 87% germination; 4th year, 88% germination; 5th year, 74% germination; 6th year, 78% germination; 7th year 24% germination; 8th year, 3% germination; 9th year, Nil.

Dews and Soil Moisture.

Miltalie Agricultural Bureau asks:—"When a heavy due falls, does it add moisture to the soil?"

Reply—"When the moisture settling on plants and soil as dew is derived from adjacent water, as the sea, or extensive lakes, then it is new water for the soil, but most dews are the result of water that has evaporated from the soil being redeposited either on the actual soil from which it came or from closely adjacent areas. As most of the dew evaporates soon after the sun comes out, dews generally mean a direct loss of moisture from soils in the neighbourhood."

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers of the Stock and Brands Department.]

Horse with Swollen Fetlocks.

Hon. Secretary, Agricultural Bureau, Whitwarta, asks cure for horse with legs swollen from the fetlocks upwards.

Reply—The swelling (oedema) of the legs is often associated with debility, "greasy heels," standing too long on hard floors, and may be the result of heart disease, etc. It is advised that you keep the horse in good condition, and if swelling occurs give a purgative drench of—raw linseed oil, 1½ pints; oil of turpentine, 2ozs. Subsequently give 1 teaspoon of powdered nux vomica night and morning for 14 days. To give, mix with treacle and smear on tongue.

Cramp in Pigs.

"Cleve" reports:—(1) *Pigs with cramp in hindquarters.* (2) *Horse which loses control of hindquarters.*

Replies—(1) Such symptoms are usually associated with a deficiency of vitamins and possibly lime in the diet. Treatment:—From a chemist obtain 8ozs. of good quality cod liver oil, and twice a day for 15 days give affected pigs 1 teaspoon. Instead of superphosphate, give the following lick:—Slaked lime, 2 parts; common salt, ½ part; mix well. Warning—It is essential that the lime be well slaked by exposure to air. Give greenfeed if available, and report progress in three weeks' time.

(2) The symptoms exhibited may be the result of an injury such as a fall or blow, or may be the result of eating damaged fodder, which causes a disease known as Botulism, the characteristic symptoms being a paralysis of nerves governing movement. It is suggested that the following treatment be tried:—Keep the horse in a stall for at least a month, giving no exercise. Change the feed if possible, supplying chaff from another source. Obtain from a chemist the following medicine:—Take strychnine hydrochloride, 10 grains; white sugar, 2½ozs. Divide into 20 powders. Directions:—Label "Poison." One to be given in a little food or dissolved in a cup of water twice a day for 10 days, then stop.

CHICKEN POX.

"Cleve" reports poultry with swollen heads with sores, scabs and eyes badly affected. Replying to this question, Mr. C. F. Anderson (Government Poultry Expert) says:—

"The trouble with the poultry is chicken pox. Any of the following treatments are generally satisfactory:—

1. Obtain from the chemist a 10 per cent. mixture of carbolic and glycerine, and paint the affected parts with this mixture.
2. Obtain a knob of washing blue, wrap in cheese cloth or similar material, moisten same, and rub it over the affected parts.
3. Paint with equal parts of iodine and water.

Thoroughly cleanse out the sleeping quarters, and spray twice a week with a 10 per cent. solution of kerosine and water."

SLIPPING BELTS.

Replying to the Secretary of the Sutherlands Branch of the Agricultural Bureau, who asks what can be done to prevent machinery belts from slipping, Mr. H. R. Nourse (Farm Mechanic at Roseworthy Agricultural College) says:—

"Both rubber and canvas or balata belts are much used on farms. Cotton, rubber or balata belts should not require very much dressing; if they should dry, a small amount of castor oil smeared on the belt will help.

There are several preparations on the market, all of which are useful; but they should be used very sparingly. These are usually sold in bars of about the consistency of soap, and are applied to the belt while it is running.

Neatsfoot oil might not harm a cotton belt, but it should not be used on rubber or balata; it is, of course, good for leather.

The cause of belt trouble with farm machines is mostly due to the fact that they are too light for the work they have to do. Other causes of trouble are:—(1) Belts too narrow; (2) belts too thin; (3) belt speed too low; (4) pulley too small; (5) incorrect alignment; (6) uneven speed of engines.

The best cure for most troubles is to use leather of double thickness, or, if of rubber or balata, use 5-ply or 6-ply."

THE AGRICULTURE OF NEW ZEALAND.

[By R. C. SCOTT, Supervisor of Experimental Work.]

One of the chief impressions gained after a tour of the Southern Hemisphere by the present Director of Agriculture (Mr. W. J. Spafford), and "Yattalunga" (Colonel C. P. Butler) of the Advertiser, was that South Australia had much to learn from the agriculturists of New Zealand. They were of the opinion that particularly in pasture management and animal husbandry on small holdings the New Zealand farmer showed special skill.

Consequently Colonel Butler conceived the idea that if a party of South Australian primary producers could be organised to tour the Dominion and see for themselves the methods adopted and the results achieved, much good would result.

The matter was taken up with the New Zealand Tourist Bureau, and as a result a party of 16 men drawn from different districts of the State made the visit during January and February of this year.

They landed at The Bluff on the southern end of South Island, and after a tour of the Southland, Otago and Canterbury Provinces, proceeded to Wellington in the North Island, which is the capital city of New Zealand. From there the party travelled through the Hawke's Bay district along the edge of the Gisborne area, circled around the Auckland Province and across Taranaki, finally returning to Wellington, from whence they boarded the boat for Australia.

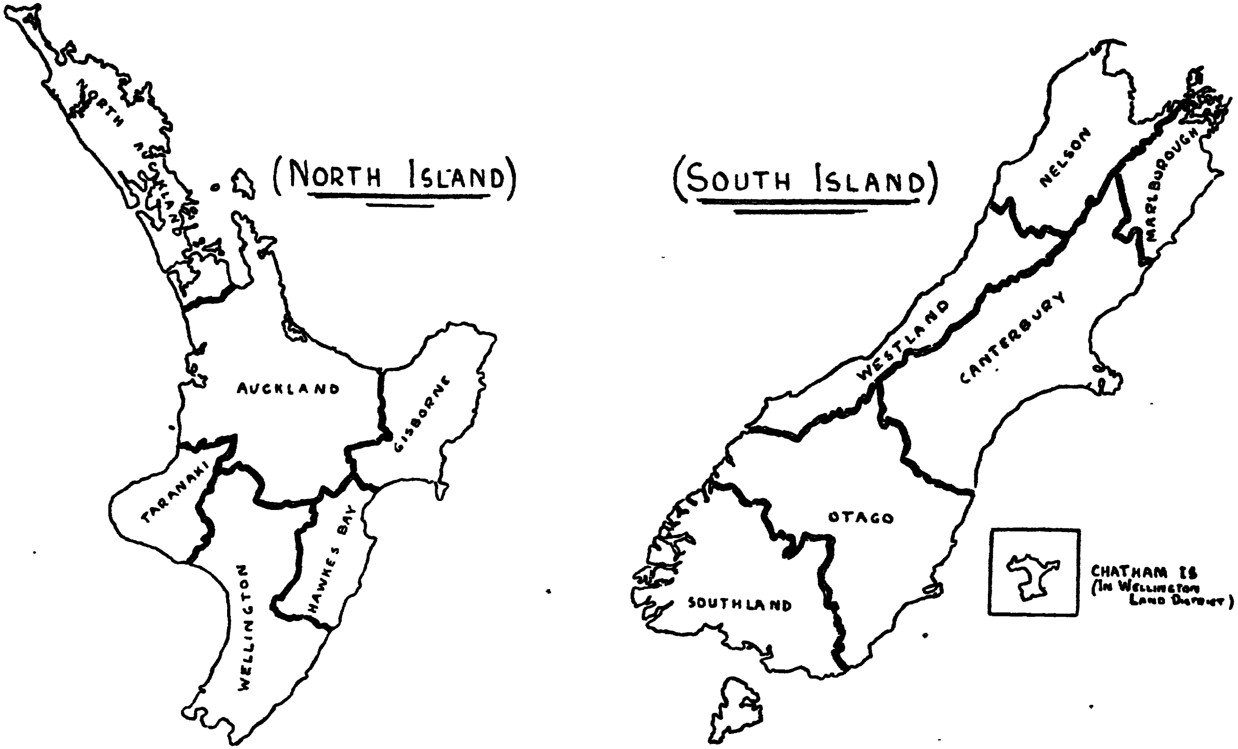
In all districts opportunity was afforded of inspecting the properties of successful farmers and observing the methods adopted. Agricultural educational institutions, meat works, dairy factories, &c., were visited, and a most interesting and instructive time was spent.

The following remarks will give some idea of the agricultural conditions of the country, but in addition reference to the scenic beauty of the land is also necessary. The view never became monotonous; even that area described as a plain, namely the Canterbury Plain, is traversed by numerous streams with glorious mountains in the background, and delights the eye of the visitor. Throughout both Islands the mountains, the lakes, the rivers, the broad valleys, the neatness of the homesteads, fertility of the country and other factors all combine to make New Zealand a most beautiful land, well worthy of visiting from that point of view alone.

STATISTICS OF NEW ZEALAND.

The total area of New Zealand including all small islands is 104,015 square miles. Consequently, as South Australia totals 380,070 square miles, New Zealand is only a little more than one quarter the area of this State.

The North Island is slightly larger than the South, the areas being 58,092 and 44,281 square miles respectively.



Map 1

Map 2

Land Districts of New Zealand.

[From *Agricultural Organisation in New Zealand.*]

Particulars showing how the land is utilised are given in the following table:—

Land Utilisation in New Zealand, 1934-35.

	Acres.	
Sown grasses, clovers, lucerne	17,388,174	
Plantations (pines)	760,420	
Green fodder	682,828	
Grain crops	641,205	
Fallow land	115,832	
Private gardens, &c.	81,694	
Orchards	25,087	
Plantations (eucalypts, &c.)	21,264	
Market gardens	7,284	
Tung trees	4,780	
Nurseries	1,276	
Hop vines	590	
Grape vines	433	
Passion fruit vines	244	
Total area of cultivated land		19,502,519
Tussock and native grasses	14,184,044	
Fern scrub, &c.,	4,079,763	
Virgin bush and forest	3,284,154	
Barren land	1,881,256	
New Zealand flax	72,828	
Total area of unimproved land		23,602,040
Reserves for public purposes, &c.	18,132,871	
Rivers, lakes, &c.	5,153,766	
		23,286,637
Grand total area		66,390,196

From the foregoing details it will be noted that practically one third of the total area of New Zealand is cultivated land, one third is occupied but is still classed as unimproved, whilst the remaining third includes areas within Borough boundaries, land unfit for settlement and other reserves.

Of the cultivated area 89 per cent. is devoted to sown pastures including lucerne, and a further 3.5 per cent. is under green and root crops. Consequently almost 93 per cent. is entirely devoted to the grazing of animals, whilst there is a further 14 million acres of tussock and other native pasture which must be included in the total area under grass.

AREA OF HOLDINGS.

The average farm holding in New Zealand is small, 75 per cent. being less than 320 acres, 63 per cent. less than 200 acres, and 45 per cent. less than 100 acres in area.

On the other hand there are a number of pastoral runs which exceed 50,000 acres in extent. These are mainly situated in the South Island and include the poorest of the occupied land. However, large areas are exceptional and only 8.3 per cent. of the holdings exceed 1,000 acres.

The average size of farms varies according to the class of agriculture practised, and is approximately as follows:—

	Acres.
Dairy Farms	105
General Mixed Agriculture	140
Mixed Dairy and Sheep Farming	400
Sheep Farming	425
Sheep and Cattle Grazing	1.700

CLIMATE.

New Zealand possesses a climate which is cool and moist, whilst there is no wide variation in temperature or rainfall either from season to season or from year to year. It is situated in the Temperate Region, and is in the zone of prevailing westerly winds. These winds are broken by striking the mountains and hilly country which generally obtains, with the result that there is frequent disturbance of atmospheric conditions, and the rain periods are not of long duration. They are spaced by intervals of sunshine, and it is this frequency of sunshine following the rain which favours agricultural production and the health of livestock. Other advantages are that they lead to evaporation, making the pastures better underfoot, they reduce the area of swamp and peat land which would otherwise occur, and lessen the liability of frost and atmospheric conditions favourable to the development of rust in cereal crops.

On the other hand the wheat varieties planted must necessarily be of hard threshing nature, shelters must be provided for livestock in the field, whilst the native tussock grass is of a tough fibrous nature.

Over the greater part of New Zealand the annual rainfall lies between 25in. and 60in., but the area averaging less than 25in. is relatively small and is mainly confined to portions of Central Otago and the Canterbury Plain in the South Island.

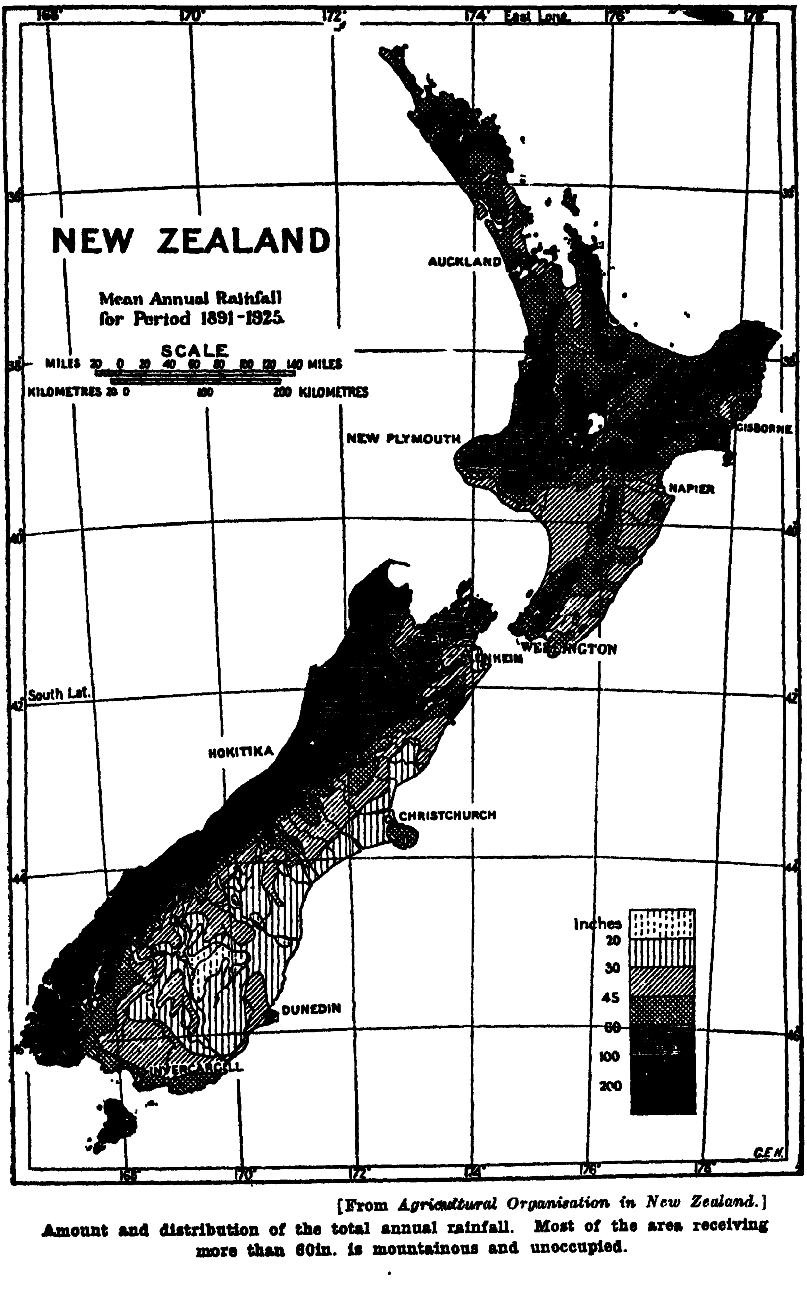
It is chiefly the mountainous and therefore the unoccupied land which receives more than 60in. of rain per annum, with some of the highest altitudes recording over 200in.

In the following map the mean total rainfall is shown, and it is interesting to note that the country shielded by mountains from westerly and north-westerly winds receives the lowest fall and the extreme is 13in. annual precipitation for an area lying midway between Dunedin and the Southern Alps. There is rarely appreciable difference in the amount of rain recorded in any one district from year to year, and although dry periods or excessively wet years may be experienced they are not common. However, it is the distribution of the rainfall throughout the year which is of interest to South Australians, who are familiar with a climate under which the great bulk of the rain falls in the winter months and relatively little in the summer. North of Auckland there is some variation between the winter and summer falls, but over the remainder of the Dominion the difference is not great, and the amount registered is fairly even for each month of the year.

The distribution at a few of the main centres is shown in the following table:—

Rainfall Distribution in New Zealand.

Month.	Auckland.	New Plymouth.	Napier.	Wellington.	Christchurch.	Dunedin.	Invercargill.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January	2.74	4.20	3.02	2.81	2.20	3.42	3.96
February . ..	3.04	3.81	2.76	2.67	1.71	2.71	3.11
March	3.01	3.75	3.16	3.11	1.98	2.94	3.89
April	3.54	4.54	2.78	3.53	1.85	2.74	4.14
May	4.66	6.21	3.71	3.98	2.53	3.11	4.34
June	4.95	5.98	3.51	4.19	2.68	3.16	3.63
July	5.07	6.46	3.82	4.71	2.69	3.01	3.28
August	4.23	5.46	3.50	3.82	1.85	3.09	3.25
September ..	3.71	5.06	2.22	3.11	1.74	2.75	3.27
October	3.72	5.47	2.23	3.41	1.69	3.12	4.50
November ..	3.31	4.82	2.43	2.90	1.92	3.25	4.41
December ..	2.91	4.28	2.31	2.84	2.15	3.54	4.07
Total . ..	44.89	60.04	35.45	41.08	24.99	36.84	45.85



[From *Agricultural Organisation in New Zealand.*]

Amount and distribution of the total annual rainfall. Most of the area receiving more than 60in. is mountainous and unoccupied.

Examination of these figures shows that the rainfall is very evenly distributed over the 12 months. Even at Christchurch where the annual fall is only 24.99in., that is to say comparative with that recorded at a number of centres in this State, the lowest rainfall month is October with 1.69in., an amount which is quite appreciable. As a consequence perennial plants are not subject to severe summer drought, whilst as there is no record of a shade temperature of 100° F. ever being recorded, with readings of 90° F. very rarely obtained, such plants are able to carry through from season to season without check and provide the evergreen pastures for which New Zealand is famed. Periods of dry and warm weather may occur, and at times spells of wet weather may interfere with haymaking and harvesting operations, but these are exceptional and generally speaking the Dominion enjoys a climate highly suited to the development of pastures, with satisfactory grain crops only possible in the medium rainfall localities. As a result the Canterbury Plain (Christchurch) is practically the granary for New Zealand.

SOILS.

The soils of the cultivated area of New Zealand are naturally fertile, their chief deficiencies being phosphoric acid and lime.

In the North Island very large areas are covered by volcanic ash forming extremely valuable pasture country. These lands are mainly situated in the Taranaki, Wanganui and Waikato districts, whilst although the wonderfully high producing Hawke's Bay area is in the volcanic ash region, these soils consist chiefly of an admixture of volcanic ash and alluvial material washed down from the higher levels by surrounding rivers. This has resulted in the formation of very fertile land with high carrying capacity for stock, whilst on the wide alluvial flats many apple orchards are situated.

Over the remainder of the North Island there is a great range of soil type varying from sands north of Auckland, poor pumice in the central regions, and fertile silts in the southern land. However, generally throughout the country there are broad alluvial plains and swamps bordering the rivers.

In the South Island the most important soil is that of the Canterbury Plain. This is of alluvial nature, varying from rich loam overlying clay to poor coarse sandy material overlying gravel. Naturally this latter type is not very fertile and is mainly situated on the fringe of the plain near the foothills. Although this class represents a considerable area it is small as compared with the full extent of the Canterbury Plain itself, which is some 150 miles long by about 40 miles wide. Consequently the greater part is really good quality soil which readily responds to cultivation and planting.

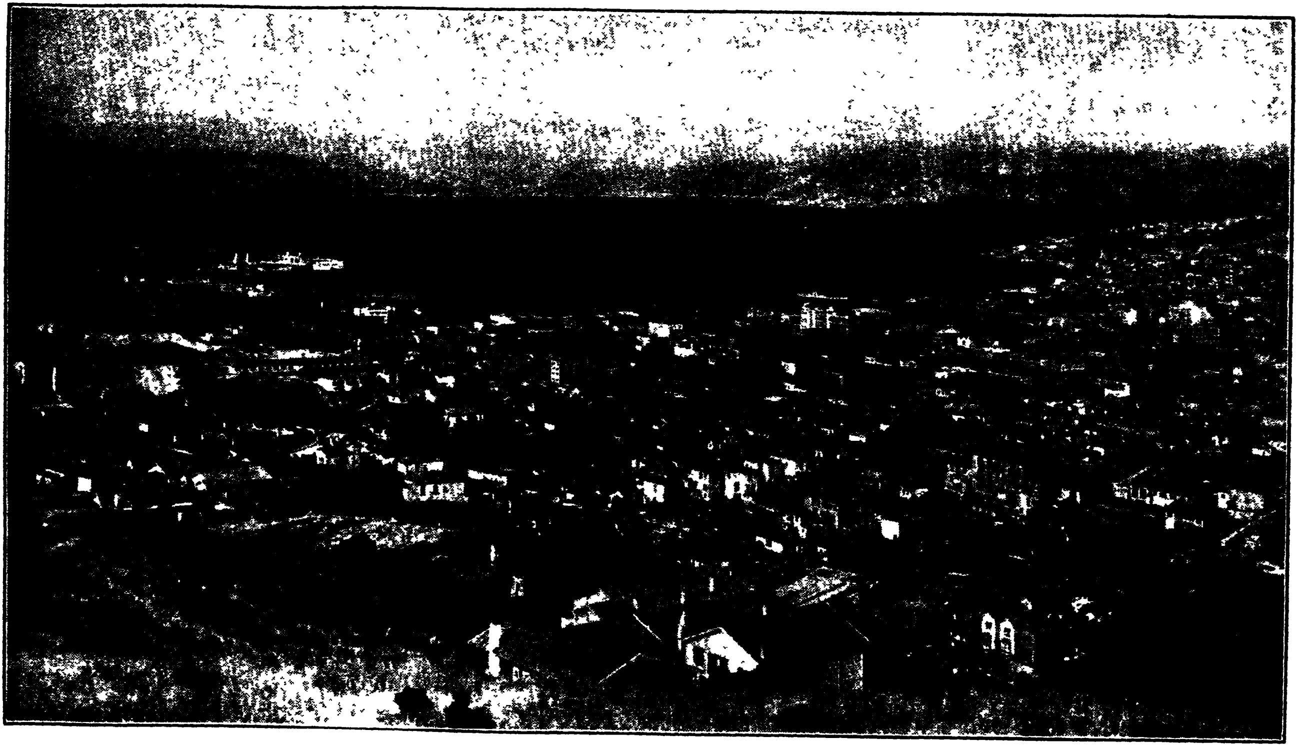
Generally throughout the Southern Province the soil is shingly on the higher levels, deep loam over clay on the undulating country, alluvial soil over gravel on the flats and river beds, with swamps at the river mouths.

The more mountainous country varies from heavy silt to stony loams and gravelly basins to greyish sand on portions of the West Coast. Reviewing the position, therefore, it may be said that the soils of the cultivated area of New Zealand are highly productive and consist of volcanic, alluvial and a mixture of volcanic and alluvial types, together with areas of rich loams and good sands, whilst in the occupied but not cultivated area the land is rougher and more stony and varies from stony loams and gravelly depressions to soils of both heavier and lighter texture.

PASTURES OF NEW ZEALAND.

The pastures of New Zealand may be divided into two main groups, namely sown pasture and natural pasture.

The former is represented by over 17,000,000 acres and the latter by a little more than 14,000,000 acres, making a total of almost 42,000,000 acres devoted to grassland farming out of the 43,000,000 acres occupied.



[Photo. New Zealand Tourist Bureau.]

Wellington City and Harbour: Wellington is the capital of New Zealand and has a population of 147,000 inhabitants

The natural pasture is generally referred to as tussock country, although over large areas finer leaved grasses and other herbage are associated with the tussocks.

At the present time by far the greater area of this class of grassland is to be found in the mountainous and dryer lands of the South Island. There are three main types of tussock, namely the Poa, Festuca and Danthonia classes, and any of these may predominate according to the conditions of soil, moisture and altitude.

The Danthonia tussock country, particularly on the lower levels, is generally capable of improvement by the planting of better pasture varieties, together with adequate liming, manuring, &c. As a rule the natural pasture land is held in large areas and on the average is capable of maintaining a sheep to about five to seven acres. Little is done in the way of top-dressing and the properties are managed on very much the same lines as the pastoral holdings in Australia. With regard to the sown pastures the most striking feature is the density of the herbage. There are practically no bare patches present, such as is regularly the case in our pasture lands where the summer killing of shallow rooted plants is prevalent.

[Photo. by H. M. Westwood.]

Members of the party at the Normanby Co-operative Cheese Factory, Hawera. 1,142 tons of cheese were manufactured in this factory in 1935, which is said to be the largest amount made under one roof in the world. The milk supplies were drawn from a radius of 2½ miles.

It is the density of pasture which explains the high carrying capacity of many farms, and in the better lands of the North Island instances of eight sheep or approximately a cow per acre were repeatedly met with.

In establishing pastures European species of grasses and clovers are invariably used; the actual varieties and mixtures depending upon the type of farming practised and the class of soil or climate obtaining in the district.

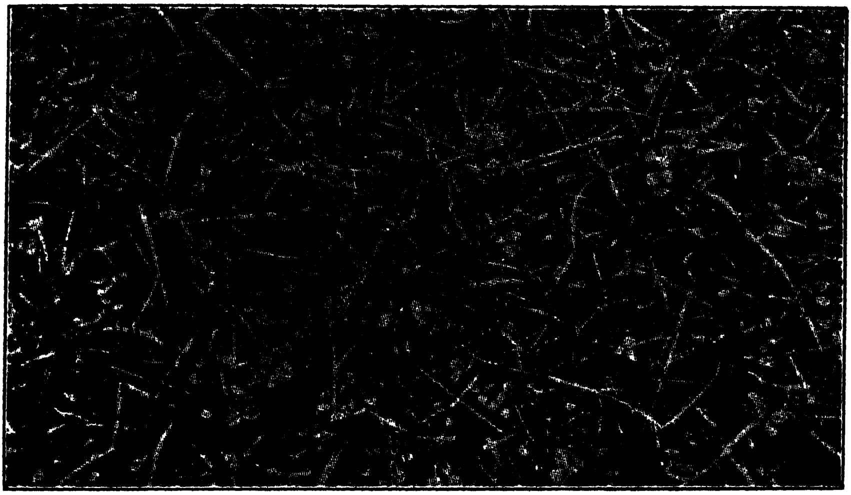
Where the stand is only intended to be of a temporary nature, such as would be the case if a hay crop was required, or where the land was only partially cleared from bush growth or reclaimed from peat swamp, rapid growing varieties are utilised. Typical seeding for such requirements is 30lbs. Italian Rye Grass and 6lbs. of Red Clover per acre.

Sometimes the application of Italian Rye Grass is halved and 15lbs. of Western Wolth's Rye Grass included. The latter is a leafy selection from Italian. It is a quicker grower in the first season, but tends to thin out to a greater extent in the second.

Again in the damper or more saline soils Alsike may replace the Red Clover. Short rotation pastures are adopted in the mixed farming areas of the South Island, occupying the land for three to four years and working in rotation with cereal and root crops. The climatic conditions of these districts do not favour long term permanent pastures, whilst it is also necessary to supply some additional feed in the winter, which means cultivation and the planting of special fodder crops for the purpose. A regular pasture mixture for a short rotation stand is:—

25lbs. Perennial Rye Grass.
10lbs. Italian Rye Grass
4lbs. Red Clover
2lbs. White Clover

On the Canterbury Plain there is a tendency for rather lighter seeding, making a total dressing of from 30 to 35lbs., but on the other hand in the Southland Province it is usual to increase the amount of seed, adding about 6lbs. of Timothy and 2lbs. of Alsike per acre.



A close up view of an excellent permanent pasture mixture consisting chiefly of Perennial Rye Grass and White Clover.

Truly permanent or long rotation pastures are planted on the better type soils of the wetter districts of both Islands, but the bulk of the permanent pasture land is to be found in the Norh Island. A typical seed mixture is as follows:—

	Lbs.
Perennial Rye Grass	25
Cocksfoot	10
White Clover	3
Red Clover	3

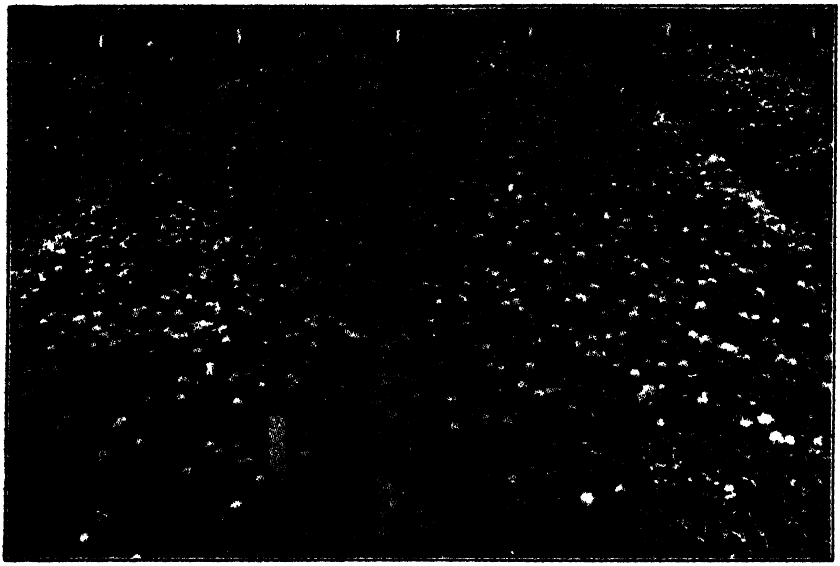
Naturally there are variations of this mixture according to circumstances, the chief of which so far as the high producing pastures of the Auckland and Taranaki Provinces are concerned is the inclusion of 5 to 6lbs. of Paspalum seed and a reduction in the quantity of Cocksfoot planted. In fact Paspalum is regularly included in the seeding mixtures for all districts enjoying relatively mild winter conditions.

Other exceptions to what may be regarded as the standard mixture for permanent pastures are:—The addition of about 6lbs. of Italian Rye Grass where quick early growth is desired, about 2lbs. of Crested Dogstail for undulating country and particularly for sheep grazing, about 3lbs. of Timothy for rich soils inclined to wetness, and about 4lbs. of Meadow Foxtail together with 2lbs. of Rough Stalked Meadow Grass for fertile land which is too wet for the successful establishment of rye grass. Such seeding is at the expense of the Perennial Rye or Cocksfoot, whilst for reclaimed salty swamps the quantity of Red and White Clover is reduced and about 2lbs. each of Alsike and Strawberry Clover are included.

On relatively new land or that of lower fertility the seeding mixture frequently includes such varieties as Brown Top, Chewings Fescue, Danthonia pilosa, Kentucky Blue, Lotus Major, Poa aquatica, Prairie Grass, Yorkshire Fog and Tall Fescue.

Brown Top thrives on the medium class soils in the hilly country, which are of a wet heavy nature, and Yorkshire Fog does well in the wet, peaty lands.

In recent years Subterranean Clover has come into prominence for the friable, open textured soils, particularly those situated on the fringe of the Canterbury Plain, whilst it is fairly often included in the permanent pasture mixture for other districts. In this case it is added at the rate of 1 to 2lbs. per acre and is favoured because of the amount of growth produced in the winter and early spring. It was stated that in the Hawke's Bay district the earliest maturing lambs were secured from those pastures including Subterranean Clover in the mitxure.



[From *New Zealand Journal of Agriculture.*]

White Clover plots at the Plant Research Station, Palmerston North. New Zealand Certified White Clover on the right. This is an outstanding type, superior in every way to all other strains. Certified seed is available and is being freely planted. Similar work has been done in the production of New Zealand Certified Perennial Rye Grass, Cocksfoot, Red Clover, &c.

SEEDING OF PASTURES.

The New Zealand farmer has quickly recognised the importance of good seed, and rarely plants other than the best. At the Plant Research Station at Palmerston North much pasture selection work has been done and improved strains of Rye Grass, Cocksfoot, White Clover, Red Clover, Brown Top, &c. isolated and seed supplies built up.

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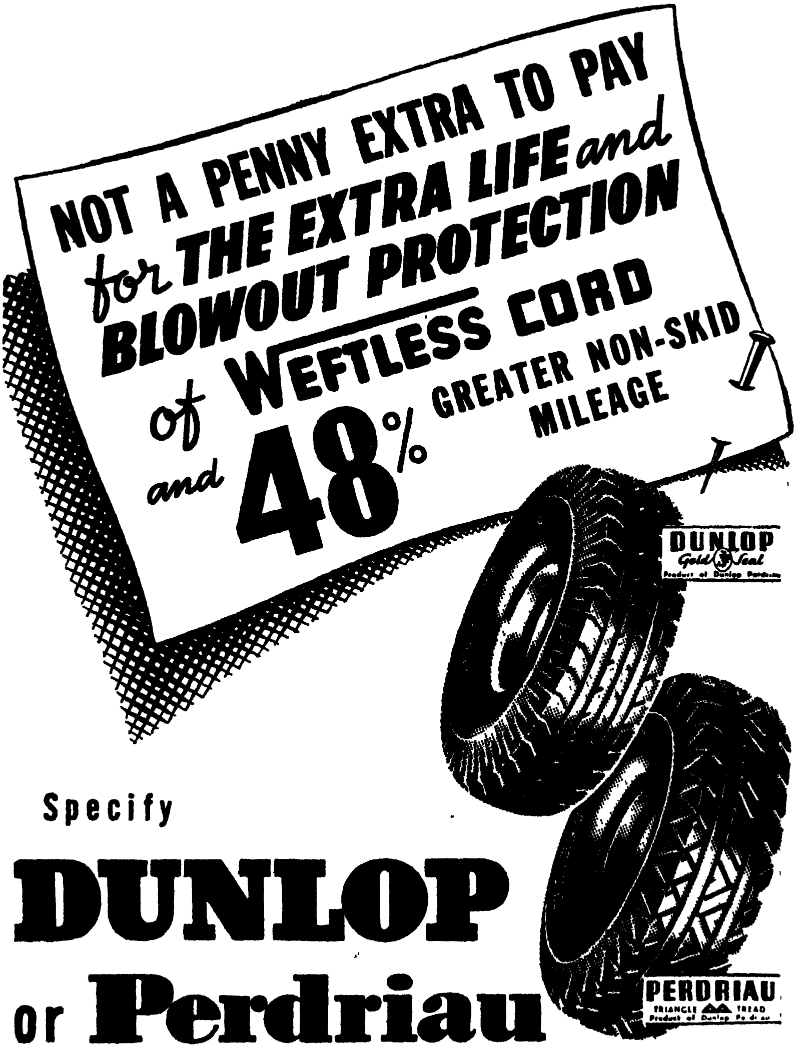

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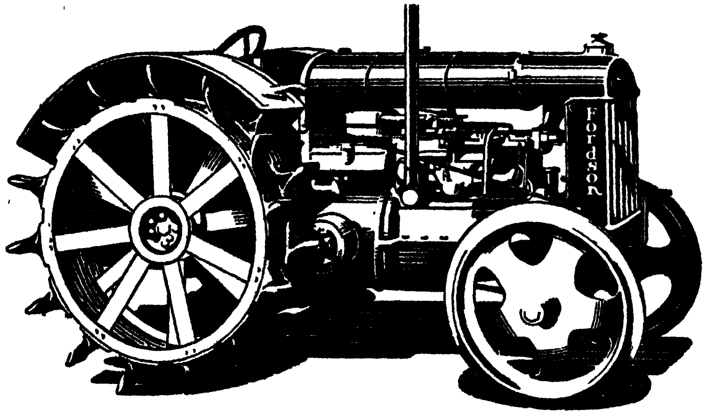

14 H.P. AT DRAWBAR — 26 H.P. ON BELT

(Tests by Mr. E. J. C. Rennie, Melb. University)

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The result has been the development of an excellent strain of Perennial Rye Grass of great persistency and yielding an abundance of leafy growth, and of a strong growing broad leaved White Clover of high productivity. As these are the two most important pasture plants in the Dominion, the work of selection and certification of seed of the best strain is leading to improvement in the permanency and yield of the grazing areas. Every care is taken in the preparation and planting of the land, and this thorough treatment is a direct contrast to much of the pasture seeding in this State where many farmers expect fodders to estabish themselves satisfactorily with much poorer preparatory tillage than they would give to crops of a more temporary nature. The soil is worked to a fine firm seed bed, and if there is neglect in this direction an unsatisfactory germination is likely to follow. The seeding period extends from spring to autumn, the majority of pastures in the warmer districts being planted in February or March, and where autumn frosts are common, spring sowings are generally adopted. The amounts of seed planted are much heavier than is customary in South Australia, and are probably associated with the favourable summer weather and the fact that the rainfall is so regular that shallow rooted plants are able to carry through. Thick seeding provides for a dense sward which can be maintained from season to season, whereas with us, perennial plants have to be relatively widely spaced and allowed to develop an extensive root system in order to be able to survive the long, hot, dry periods frequently experienced in our climate.

Superphosphate is regularly applied at seeding, usually alone but occasionally in conjunction with bone dust. The amount varies from about 1 to 3cwt., whilst one instance was met with in the Waikato district where 3cwt. of superphosphate and 2cwt. of bone dust were drilled in with the seeding mixture.

MANAGEMENT OF PASTURE.

Annual top-dressings of fertiliser are applied to pastures, and more information in connection with manures will be given under that heading.

After establisnment, the pasture is permitted to reach a height of 4 to 5in. before feeding, and the principle of rotational grazing is fairly closely practised. The intervals between grazing are rather shorter in the case of sheep than cattle, and the herbage is kept more closely grazed. However, this close grazing is not allowed to continue for more than a few days, since severe feeding-off limits the production of pasture.

Well grazed pastures may be spelled for about three weeks without appreciable loss in the feeding value of the produce, and this is the general practice with dairy cattle, but in the case of sheep, particularly ewes and lambs, the change from one class of fodder to the flush of growth in a new field has a bad effect upon the stock themselves, and with sheep, weekly resting periods or even less are not too short.

So as to permit regular grazing most farms are closely sub-divided, and properties consisting of from 12 to 30 fields are by no means uncommon.

An illustration of the handling of sheep under an intensive grazing system was gained at Marton in the North Island, where the farm has been divided into 14 fields each of seven acres. This area carries 900 breeding ewes and the lambing is consistently about 100 per cent.

From about February, when all lambs have been sold, the ewes are held in one flock and moved from paddock to paddock daily. That is to say, each field is grazed at the rate of about 130 head per acre for one day and then spelled for 13 days.

When lambing commences in July or August the daily moves continue, but only the unlambed ewes are shifted, the remainder being left behind in each field until there are sufficient to justify grouping in one flock and shifting each day. The idea is eventually to divide the ewes and lambs into two flocks of approximatey equal numbers and rotate each of these over seven paddocks. Consequently from about September onwards each field is grazed down once in seven days, that is to say, at the period of the year when the pasture is making the most rapid growth there is a shorter time between each grazing. Should the feed tend to get beyond the best stage one or more fields are shut up for hay and the flocks rotated in daily shifts over the remaining five or six paddocks.

On dairy farms the sward is allowed to become taller, and the practice is to graze off the top growth rather than the lower 2in. In the spring and early summer the growing periods may extend to almost three weeks, with longer spells over the remainder of the year. Naturally the milkers are first turned into the clean, fresh pastures and followed up by the young and dry stock. When these have been removed the roughage may be topped off with a mower and the field harrowed. However, this harrowing is carried out almost entirely with the object of spreading the droppings of animals and is never so severe as to pull out any of the pasture plants.

A high-producing pasture at Hastings. This field is stocked at the rate of two cattle and six sheep per acre, and had carried this number for four months. It could continue to hold this number for at least two more months but owing to wet conditions only light grazing was secured in the winter. All animals were in good condition with over half the cattle in prime order.

Again, on most sheep farms cattle are also kept to consume the rough coarse feed left by the sheep and maintain the herbage in the best possible condition for the production of nutritious fodder.

OTHER FODDER CROPS.

With improved pasture production following top-dressing, farmers are now conserving their surplus fodder as hay or ensilage, and the planting of supplementary fodder crops is not as popular as formerly. However, each season from 600,000 to 700,000 acres are planted mainly with turnips, rape, swedes and mangolds.

As a rule these crops are associated with the short-rotation pasture districts, and if the area is such that pasture stands tend to run out in say five or six years, a rotation is adopted which will bring each field under a fodder crop every five or six years, and by such means prepare the land for planting down to grass.

The most popular crops are turnips and rape, and large areas are to be seen in the Canterbury Plain, Hawke's Bay, Otago and Southland districts. They are mainly fed in winter, early spring and autumn. As a supplementary winter feed for cows several thousand acres of mangolds are also planted, the chief areas being Canterbury, Wellington, Taranaki and Auckand.

PASTURE ESTABLISHMENT ON PUMICE LAND.

Of recent years much has been done in the development of pumice land in the North Island. There are large areas of this class of country in the Auckland Province, extending towards the Bay of Plenty. It was generally regarded as being quite useless except for tree planting. However, the demonstrations that have been provided indicate that it is capable of producing really good pasture, provided that sufficient capital is available for the purpose.

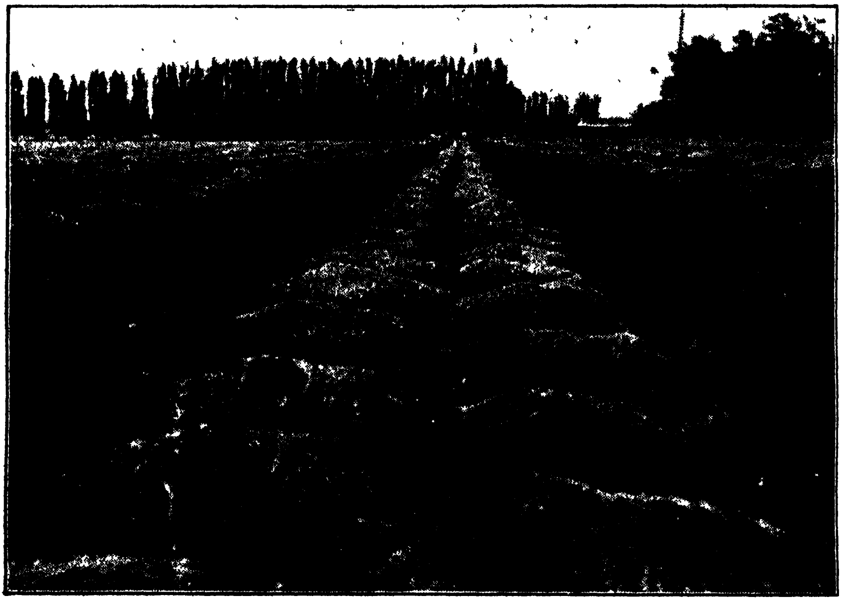
[From *The New Zealand Farmer.*]

Sheep grazing on a heavy crop of Swedes. This is one of the most popular of the supplementary crops for sheep.

Pumice itself is solidified volcanic froth containing mineral plant food, but because of its formation most of this is present in an unavailable form. However, by compaction and the incorporation of organic matter the pumice can be slowly decomposed, giving rise to a fair quality soil.

In its natural state pumice land is covered with a dense tangled mass of tea-tree, tussock, &c., which is first cut down and burned. After ploughing on a medium furrow the land is left in a relatively rough state to allow aeration and sweetening, and then some four or five months later packed down by heavy rolling. After shallow tillage it may be planted either with a temporary pasture consisting of Italian Rye Grass and Red Clover or with turnips, although sometimes a permanent pasture mixture is sown straight away.

The secret of success appears to be good compaction of the soil and adequate dressings of superphosphate. Applications of 6cwt. and sometimes 10cwt. to the acre in the year of establishment are necessary, followed by yearly top-dressings of at least 3cwt. per acre. The cost of bringing pumice land into production is therefore high, and figures from 12 dairy farms obtained by the New Zealand Department of Agriculture indicate that when all costs including buildings, fences, pastures, &c., are taken into account the expenditure lies between £16 and £19 per acre.



Perennial Rye Grass seed crop cut for threshing. Note the double row of cocks. Each cock can be lifted as a single forkful.

However, with proper management the carrying capacity rapidly rises to about half a milking cow per acre, and on the older farms to two-thirds of a cow or more.

Consequently the development of pumice land, which in its natural state is from an agricultural point of view most unattractive, has been proved an economic proposition and has opened the way for future agricultural expansion.

GRASS SEED IN NEW ZEALAND.

New Zealand has built up a large business in the harvesting and sale of grass seed, a trade which is likely to expand with the development of improved strains and the seed certification scheme now in operation. Approximately 100,000 acres of grasses and clovers are cut for seed each season, and of this area about 85 per cent. is situated in the Canterbury, Otago and Southland districts in the South Island, and most of the balance in the Hawke's Bay area in the North Island. The grain is harvested both by cutting and threshing, and also by stripping in the field. The latter method is associated with the lower rainfall districts, and on the Canterbury Plain it was interesting to see miles of fencing over which bags containing material from the strippers had been hung. The bags were only partly filled, making a layer some four to five inches thick, and by hanging in this way the grain, straw, &c., are able to dry right out before being cleaned. However, cleaning on the farm is relatively rough, and most grass and clover seed is machine dressed by merchants before being offered for sale. The chief seed crops are Perennial Rye Grass and Chewings Fescue, together with Red Clover, Cocksfoot, White Clover, Crested Dogstail and Brown Top, the most important of the others. Large quantities are exported to the United Kingdom, Australia, America and Canada, the first named country taking practically all the Crested Dogstail seed available after the local demand has been filled. The average yield of rye grass seed is from 17 to 20bush. per acre, White Clover, 120 to 150lbs.; Chewings Fescue, 200 to 250lbs.; Cocksfoot, 160 to 180lbs.; and Red Clover, 160 to 180lbs.

MANURES IN NEW ZEALAND.

A large amount of experimental work relative to the use of fertilisers has been carried out, athough there are still many problems awaiting solution. The outstanding result of these investigations has been the indication that phosphoric acid is the major limiting factor in crop growth and phosphatic fertilisers are easily the most important in the Dominion.

Deposits of phosphate rock occur but these are of relatively low grade, and as is the case with Australia, New Zealand obtains her supplies from the phosphate mines of Ocean and Nauru Islands.

Approximately 2,000,000 acres of pasture land are top-dressed annually, and the average application amounts to 2½cwt. per acre.

The quantities range from 1 to 2cwt. per acre applied once every second or third year, to 6 or 7cwt. per acre each year.

The mean dressing for the smaller dairy farms in the high producing districts is approximately 3cwt. per acre per annum, and for the larger dairy farms, about 2cwt. per acre per annum. The sheep farms receive less, whilst the applications are not so regular. Finally in the extreme fertile soils of the Hawke's Bay area many fields do not receive any fertiliser at all. March to May is the regular top-dressing period with lesser quantities applied in spring. As the result of very careful experimental work it has been shown that summer and autumn applications are better than winter or spring dressings, since when given at this time they appreciably improve production during the period of minimum growth, namely in the winter. Further, there is little advantage in applying two or three times during the course of the year as compared with once so far as total production of fodder is concerned. On the other hand, applications made just prior to periods of low production are definitely of advantage in spreading the pasture return. Moreover, late spring dressing increases the phosphate content of the herbage produced during the summer, and this may have an important bearing on the health of stock.

Lime is second to phosphate in quantity applied to the land. There has been a marked increase in the amount used in recent years, and in 1935 over 200,000 tons were utilised.

New Zealand has a number of easily accessible limestone deposits, the material of which is mainly of a soft nature, and can be ground to a powder at a reasonable price. As far as could be gathered the usual charge for ground carbonate of lime is from 11s. to 15s. per ton, whilst free railage up to a 100 miles distance is granted to *bona fide* farmers purchasing lime.

It is in the form of ground limestone that the lime is regularly used, and quicklime or slacked lime is very rarely availed of. However, it is surprising to find that lime is not sold under a guaranteed analysis, nor is there any standard for fineness of grinding.

Lime is more generally used in the North Island than in the South Island, but on the other hand a greater quantity is applied annually in the latter than the North Island. This means that the average dressing in the South Island is heavier but less frequent than that of the North, and applications of a ton or more per acre every four or five years are quite common, whereas in the North Island dressings of from 5 to 7cwt. per acre every other season are regularly adopted. Taking New Zealand as a whole, the mean application of lime per acre is 5½cwt. There has been no experimental work to test small and frequent applications with larger and more widely spaced dressings, but the general opinion appears to favour the addition of about 5cwt. per acre in alternate years. However, there has been much experimental work to show the response following liming; although the majority of such plots are simply field demonstrations, and no attempt to measure the increased pasture obtained has been made.

[From *The New Zealand Farmer.*]

Effect of carbonate of lime on pasture. Plot on the left was dressed with superphosphate only and that on the right with both superphosphate and carbonate of lime. The mean application of lime in New Zealand is 5½cwt. per acre and 200,000 tons are used annually.

An extensive programme of trials was conducted by the Department of Agriculture, and in many districts general improvement resulted, whilst in some areas the response in 75 per cent. of the experiments was classed as good to excellent.

Consequently, liming is a general practice, but this does not obviate the necessity of applying superphosphate, and the best results follow applications of both materials. This response to dressings of ground limestone impressed all members of the party, and as a result a series of demonstrational trials with local carbonate of lime has been planned for commencement this year in the higher rainfall and swamp areas of this State.

The work done with nitrogenous fertilisers has indicated that this class of manure is important in promoting the growth of out-of-season grass, but on the other hand, such increased growth is frequently followed by a slump in production. Since 1929 there has been a marked reduction in the quantity applied, and the tonnage imported to-day is only about one-third of that received six years ago. Generally speaking, nitrogen fertilisers are not regarded as being of economic value for the grasslands of New Zealand.

As a rule the soils of the Dominion are well supplied with potash, the exceptions being parts of the Taranaki and Southland districts. In these localities 1 to 2cwt. of muriate of potash is applied annually.

So far as the manuring of other crops is concerned, the usual dressing for supplementary fodders, such as turnips, swedes, rape, &c., is from 2 to 4cwt. of superphosphate per acre at seeding time. With the cereals approximately 1cwt. of superphosphate is added, the explanation for the relatively small quantity needed being, that such crops are generally favourably placed in the rotation.

For potatoes, 3cwt. of superphosphate and 1cwt. of sulphate of amonia is the regular manuring on the lighter land, increasing to 5 to 6cwt. of superphosphate and the same quantity of sulphate of amonia for the more fertile soils.

(*To be continued: the next instalment will deal with Dairying and Sheep.*)

TOBACCO GROWING.

PROGRESS REPORT ON INVESTIGATIONS, ETC., IN SOUTH AUSTRALIA.

[By R. E. Courthope Giles (Tobacco Instructor).]

The 1935-36 season has been a rather peculiar one for South Australia, for although the drought experienced has been exceptionally severe, crops are above the average in quality for the past few seasons, and because of a variety of reasons from which valued information has been obtained.

In the past, although early planting was always considered advisable to obtain the full benefit from the spring rains for plant growth with the dry summer months of January and February for ripening and harvesting the crops, the prevalence of Blue Mould rendered this almost impossible.

By the adoption of the Benzol method of raising seedlings, ample supplies of disease-free plants were available during October and November last to a number of progressive growers, who raised their requirements by this method under the supervision of the Department. Seedlings were also grown at Berri Experimental Orchard and at the Experimental Tobacco Farm at Penola in the South-Eastern district of the State. These frame-grown seedlings were ready for transplanting from six to eight weeks in perfect condition, and were very much earlier than would have been possible by the open-bed method.

Some 50,000lbs. of leaf have been cured, the major portion being grown by seven growers, all users of Benzol.

The majority of growers, who have used the open-bed method as in the past, have all suffered to a certain extent through Blue Mould, and owing to late planting and drought conditions have had very disappointing results, yields being very light and of poor quality.

Early plantings from Benzol beds have been entirely satisfactory, the quality being excellent.

NEW REGULATIONS UNDER THE TOBACCO INDUSTRY PROTECTION ACT, 1934.

The occupier of any land on which self-sown tobacco plants are or shall be growing, shall every year before the 31st day of July, completely destroy all tobacco plants by fire or burial.

It is now proposed at the suggestion of tobacco growers that the use of hydrocarbon vapours should be made compulsory in the raising of tobacco seedlings in order to eliminate as far as possible all avoidable sources of infection from Blue Mould.

Owing to the prevalence of wild tobaccos throughout the State, it would not be feasible to entirely eradicate the disease.

PESTS AND DISEASES.

Murray Irrigation Area.—Experimental plots of tobacco of 24 light varieties were established in various parts of the irrigation areas, between Renmark and Cobdogla, with the assistance of a number of landholders.

Tobacco Experiments at Waite Institute.

Dungowan Tobacco, grown at Macclesfield.

Adequate protection from the high winds was obtained by means of strips of sunflowers and maize, which were well established before transplanting took place.

A considerable amount of damage was done to crops during December and January last by insect pests, bud worm, stem borer, cut worm, and later by leaf miner. Keen growers overcame these difficulties by means of sprays and baiting, and succeeded in growing sound leaf.

Adelaide Hills and South-East.—These areas have been quite free from insect pests during the past season, Blue Mould being the chief trouble. Two cases of Frenching were found in the South-East, and a few isolated plants suffered from Mosaic. Dry conditions probably account for the small amount of damage done.

DISEASE RESISTANCE.

The Dungowan variety has as usual shown a certain amount of resistance to Blue Mould. However it is highly probable that Dungowan will lose its position as first favourite among growers owing to the success obtained this season with better-textured varieties, which prior to the discovery of the Benzol method it was almost impossible to grow in South Australia, but which with this treatment have done remarkably well this season.

SOILS.

The location of suitable tobacco soils is being steadily carried forward. Large areas are available for development in the South-East and Adelaide Hills areas, with rainfall of from 26in. to 32in. per annum. In the average season these rains are sufficient to ensure quick growth, providing that October planting is possible. Throughout the South-East water is readily obtainable from shallow bores or wells, and irrigation would not be a very costly matter. By next season several small irrigation systems will have been installed, more or less as an insurance against such a drought as at present obtaining.

Murray Area.—The success or failure of the experiments carried out in the Irrigation Areas has been decided entirely by the suitability or otherwise of the soils utilised.

Crops grown on the light Murray sand which is of an ashy nature have grown and cured well, and from a smoking point of view have highly desirable characteristics.

Yorke Peninsula.—Good land is to be found in the Stansbury Scrub Area, but development will be governed entirely by artificial water supply and the provision of adequate windbreaks.

The results obtained by an experimental plot are of a most encouraging nature, and certainly warrant further investigation.

Tintinara.—The foregoing remarks upon the Yorke Peninsula apply equally to this locality, but experiments here were not of a satisfactory nature, as transplanting was carried out too late in the season.

CULTURAL.

Every tobacco grower in the State is visited monthly by the Tobacco Instructor who assists with each phase of production from the seedbed until the leaf is finally marketed.

Varietal and fertiliser trials are conducted in collaboration with the growers.

The Departmental curing barns have been in operation in the Murray Area during the current season to assist new growers. Another barn is being erected in the Hope Forest Area for experimental work in the Adelaide Hills, while a tobacco experimental farm is being established near Penola in the South-East, properly equipped with barns, bulk store, and grading shed, where large-scale experiments can be carried out in the forthcoming season.

No encouragement is being given to old growers who have for various reasons ceased operations if their land is not considered entirely suitable for the production of the type of leaf which is at present in demand.

As the Benzol method of raising seedlings will undoubtedly facilitate and so encourage production, growers are being warned that improved quality will be necessary in future, as buyers will be in a position to pick and choose.

The incompetent grower will be forced either to improve his methods or finally cease production.

ACTIVITIES AT ROSEWORTHY AGRICULTURAL COLLEGE, 1935-36.

PART I.—AN OUTLINE OF WHEAT GROWING ATTAINMENTS AND THE CONSERVATION OF FODDER IN THE LIGHT OF PREVIOUS RESULTS FROM THE COLLEGE FARM.

[By Allan R. Callaghan, D.Phil,, B.Sc. (Oxon.), B.Sc.Agr. (Syd.), Principal,

INTRODUCTORY.

The college farm constitutes a complex unit, which, to the ordinary farmer, is difficult to describe; only by direct contact with the specialised work in hand can a true conception be formed of what is entailed. The farm is to the college, what the chemistry laboratory is to the chemist, or, more aptly perhaps, what the workshop is to the designer. It serves as a very essential background to student instruction, for, to the students, it affords a means whereby they may see, do, and follow classroom instruction in practice, be it with livestock, cropping operations or horticulture technique.

To those of us who have the responsibility of management and supervision it serves as a workshop which enables principles to be put to the test of actual practice, for the dual benefit of students and the farming community generally. It also serves the very important function of field experimentation, and upon such, progress in agriculture and livestock husbandry is wholly dependent. Whatever the theory disclosed or hypothesised by the scientific research officer, if it is to serve the man on the land, it must have utilitarian significance; to assess this significance it must first be applied under farm conditions.

The college farm has, therefore, the twofold object of demonstration and experimentation; the relative development of both represents the outward expression of the thought of the institution. In turn, the results obtained are a measure of the worth of the initial thought and its practical application. Having applied precepts successfully, they are no longer such, for they become absorbed in the general everyday knowledge of agricultural practice. In this respect it is impossible to conduct the diverse activities of a large mixed farm one season after another on a progressive and active basis, without realising what a multitude of problems remains unsolved, even unexplored, and from the experiences of every season new ideas crowd one upon the other necessitating a sorting out, followed by the application of some.

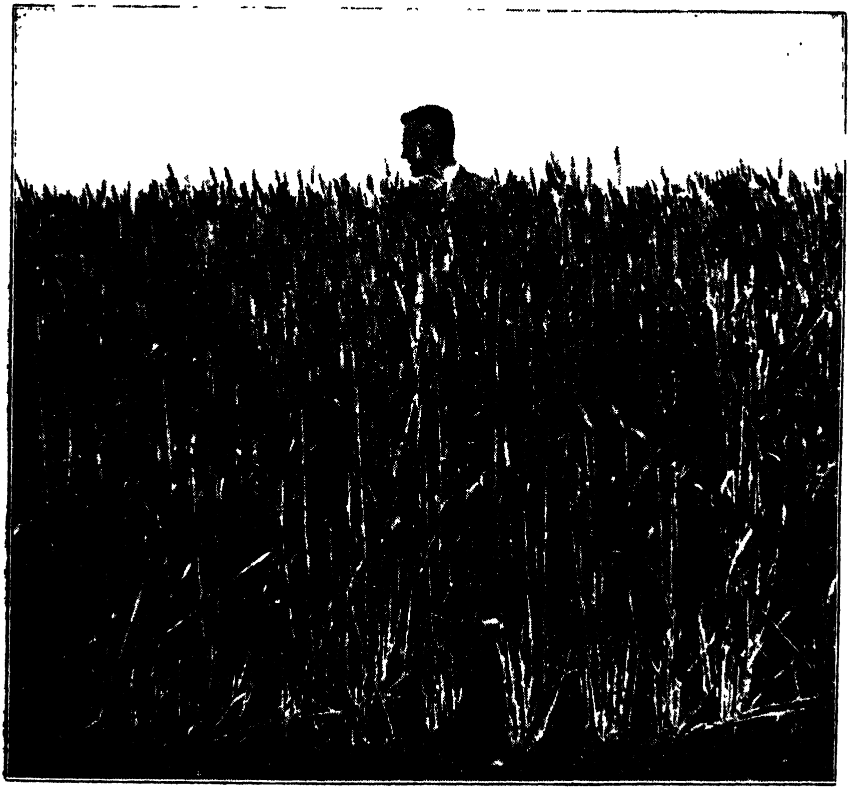
The college has now had over fifty years of experience along these lines; during that time vast strides have been taken in the progress of agriculture. To that progress, especially as it applies to this State, the college has contributed well. The influence of college work has been very diverse, and there are few avenues of farming which have not come within the orbit of its investigation. As contributions to the general welfare of the farmer, just claim can be made by the college to such phases as the development of dry farming methods and the use of superphosphate in the early days, the breeding and selection of cereal varieties, especially wheat, suitable to the environment of our own particular wheat areas, the growth of vines and proper pruning methods; the development of rotational systems to meet the agricultural development from the mere pioneering stage to the stage of balanced diversified farming, and in this latter connection, the sponsoring of the fat lamb industry as an integral part of that system, coupled with the application and advocacy of a proper system of fodder conservation. Incidental to such major developments, details of practical knowledge have accrued and general procedure with cropping and livestock activities has become increasingly efficient.

My intention, therefore, at the outset of this year's report is to incorporate some of the data of previous years, partly to demonstrate the progress made, partly to afford significant relief to the excellent results obtained on the farm during the last three years, and especially 1935, and partly to summate the results for future reference and guidance.

Unfortunately, college records are far from complete. The most that are available record cereal cropping results since 1904. These form a useful guide and setting for the results obtained in recent years, and cover the most important aspects of college field work. Latterly, livestock have become so important a part of our agriculture that a gauge to progress has become more essential and for the last three years regular figures of livestock carried have been featured in these annual reviews. As an index to the policy of earlier years, however, fodder conservation can be taken into account, and in this respect comparative data are available.

WHEAT GROWING RESULTS.

From the beginning, wheat has been the main crop grown on the college farm. Except for an occasional season or two no results of any consequence are available for the twenty years prior to 1904. This is most unfortunate, for during those years of initial experience dry farming methods were being developed and the full use of superphosphate as a fertiliser was being appreciated. These two developments, based on the seasonal experiences of those early days, must have had very telling influences on the yields obtained.



Favourable conditions during the growing period of the crop in 1935 meant that thick stands of Wheat finished well, to give high yields of plump grain.

The records from 1904 onwards are complete, thanks largely to the systematic efforts of Professor Perkins, who took charge of the college in that year. For the most part the fluctuations in the figures find explanations in reports published from year to year, but as time progresses the major experiences of past seasons become absorbed in the general knowledge of wheat growing, and eventually the year's results enter the college records as nothing more than a line of figures in a table of statistics. It is wise, therefore, that detailed accounts should be made available each year to explain how each season's results are achieved. By this means they are held, for a time at least, from the uninteresting climax aforementioned.

It must be admitted, however, that the accounts do lose much of their immediate application as the years pass, but certain aspects are always of significance when comparisons are sought. In this respect the relationship between wheat yields and the seasonal rainfall obtained acts as a guide to the growth in the efficiency of farming methods; this is especially applicable on one farm where seasonal comparisons are desired. It is not, by any means, infallible, but it is a more useful and reliable indication of most season's results than the actual bushel yield itself. Of this an excellent example is afforded in the college yields for 1914. The actual yield per acre in this year was very low at 11bush. 28lbs. but this yield was high in proportion to the amount of rainfall received during the growing period of the crop (only 4.85in.), giving a figure of 2bush. 21lbs. per inch of seasonal rainfall. Similarly, in 1929, although the actual yield was only 15bush. 11lbs., the yield per inch of seasonal rainfall was good at 1bush. 51lbs.

This review is largely based on this relationship between rainfall and yield; for this reason some amplification is advisable. The college farm, like the whole of the main wheat areas of Australia, is dependent upon winter rainfall and the growing period of crops is from April to October inclusive. The State Statist computes the so-called "Useful Rain" of his statistical reports, from the period April-November inclusive, but November, under the conditions prevailing at Roseworthy, cannot be regarded as part of the growing period of the wheat crop, for by the end of October all growth has ceased and November rains are more of a hindrance than a help. The April-November figure, however, is probably fair and logical for late districts, but for the sake of general and specific comparisons with college data, the April-October figures have been compiled and are used herein.

ROSEWORTHY AGRICULTURAL COLLEGE.

Average Yields of Wheat on the College Farm, 1904-35.
in Relation to Seasonal Rainfall.

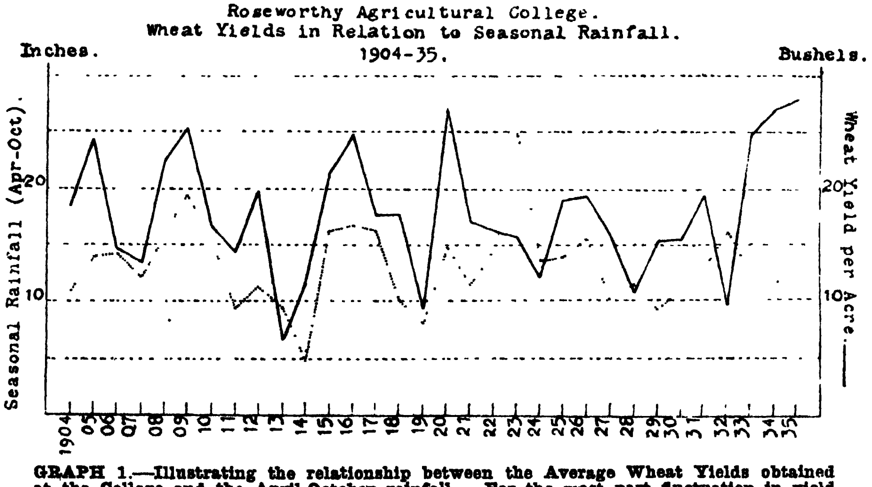
Season.	Total Rainfall. Ins.	Seasonal Rainfall, April-October, inclusive. Ins.	Area Harvested. Acres.	Average Yield Per Acre. Bush.	Lbs.
1904	14.70	10.73	330	18	3
1905	16.71	13.98	212	24	11
1906	19.73	14.05	318	14	30
1907	15.13	12.02	178	13	20
1908	17.75	15.45	259	22	14
1909	24.05	19.07	328	25	5
1910	23.87	15.61	267	16	38
1911	13.68	9.41	235	14	17
1912	14.97	11.21	233	19	36
1913	15.66	9.61	333	6	32
1914	9.36	4.85	149	11	28
1915	19.76	16.12	367	21	13
1916	23.23	16.64	331	24	44
1917	21.86	16.07	353	17	32
1918	12.01	10.15	320	17	36
1919	12.38	8.17	330	9	22

Average Yields of Wheat on the College Farm, 1904-35, *in Relation to Seasonal Rainfall.*—continued.

Season.	Total Rainfall. Ins.	Seasonal Rainfall, April-October, inclusive. Ins.	Area Harvested. Acres.	Average Yield Per Acre. Bush.	Lbs.
1920	19.30	14.88	341	26	57
1921	17.16	11.33	286	16	56
1922	20.00	14.88	305	16	6
1923	27.46	24.94	184	15	44
1924	16.00	13.53	235	12	17
1925	14.18	13.90	248	18	56
1926	16.63	15.72	268	19	16
1927	11.73	10.05	312	15	44
1928	11.85	11.71	378	10	46
1929	9.73	9.24	251	15	11
1930	11.77	11.20	306	15	24
1931	15.18	13.00	286	19	33
1932	21.03	16.17	333	9	45
1933	16.85	12.61	389	24	51
1934	14.38	11.33	407	26	57
1935	18.49	14.67	245	27	59

Mean annual rainfall, 17.47in.
Mean wheat yield for 32 seasons, 17bush. 46lbs.

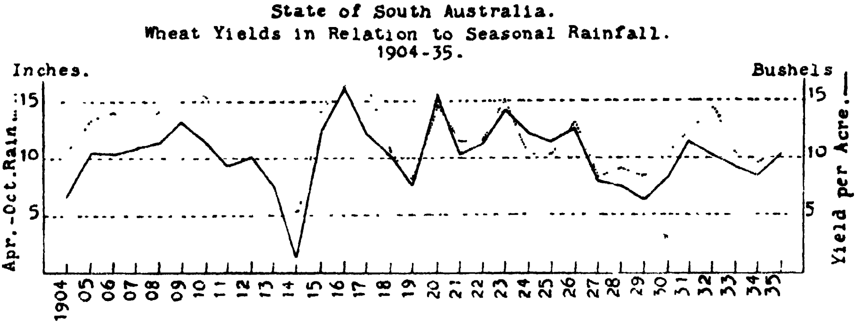
Certainly some incongruous results do appear, but this is only to be expected where a fairly long period is under review for there are other factors which do militate against good results. A rust epidemic may be particularly virulent or storm damage severe in a year of high rainfall, with the result that low yields may be recorded. From Graph I. the 1923 figures seem to be the most inconsistent of all, but here again untoward circumstances impaired the season's results. In that year continuous winter rain delayed and complicated seeding; the seed was eventually sown in a seed-bed heavily laden with moisture and, indeed, only half the seeding programme was ever finished.



GRAPH 1.—Illustrating the relationship between the Average Wheat Yields obtained at the College and the April-October rainfall. For the most part fluctuation in yield corresponds closely with the variation in seasonal rainfall. Generally speaking, the further the yield curve lies above the rainfall curve the more thrifty the crop growth, and, by inference, the more efficient the farming.

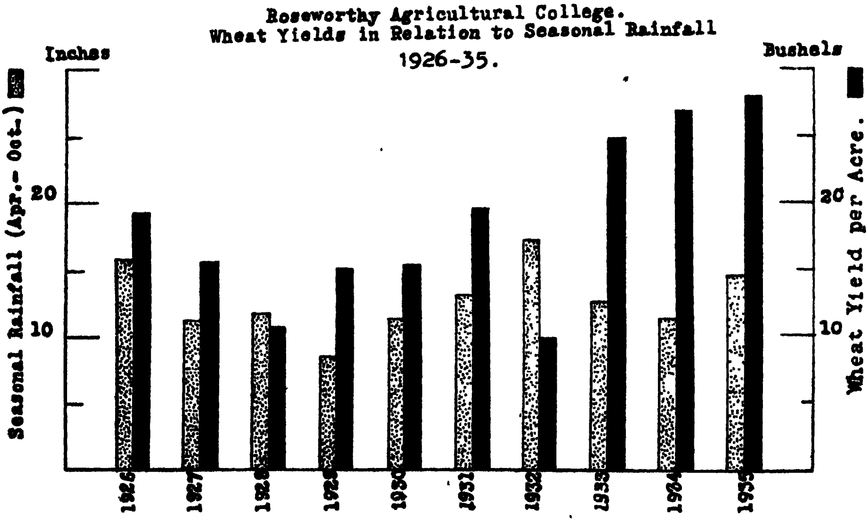
For the sake of contrast, and from the point of view of general interest, I have graphed the State average yields, and April-October rainfall, on the same scale as the college farm results. While it is not inferred that the comparison is a fair one, the parallel nature of the two sets of curves is an indication of how far seasonal fluctuations controlled college, as well as State, average yields.

Besides natural phenomena the story of college farming has also been affected by accidental factors which one can only class in the category of human agencies. The poor results of the season 1932 can be wholly attributed to this cause. At the time when soil preparation should have received careful attention college affairs were in the melting pot, student labour was unavailable for the working of fallows, and later, when matters of administration and policy were settled, heavy rains made seeding difficult and well-nigh impossible.



GRAPH II.—Depicting the Average Wheat Yield for the State of South Australia in relation to the April-October rainfall. In this case the yield line lies below the rainfall curve, but both follow the same general trend as those in Graph I.

It must be conceded, therefore, that in some years the accidental factor has had an adverse effect upon yields, and presented fluctuations in the records which cannot be explained on a general basis. The last three seasons, 1933, 1934, and 1935, have been fairly free of the accidental circumstances mentioned above, except that some losses were occasioned by rust in 1933, and by hail damage in 1935. All three seasons have been especially notewothy, and, as the graphs indicate, as far as wheat yield is concerned they are outstanding years in the college records.



GRAPH III.—Portraying, in graphic form, the Average College Yields (black) over the last decade in relation to the seasonal rainfall (dotted). Note the exceptionally good results obtained in the last three years.

The analysis of the data of past years, together with those of the last three seasons, reveals the following highly satisfactory conclusions, all of which indicate that college farming has progressed on sound and unimpeachable lines. These results are substantially illustrated in Graph I. and III.

Firstly, *no three successive seasons have given such consistently high returns. The average for the three years was 26bush. 36lbs., which is 9bush. 44lbs. above the mean yield of the previous 29 years.* The mean yield has been raised in the three years from 16bush. 52lbs. in 1929 to 17bush. 46lbs., or, in other words, by 54lbs.

Secondly, *in 1933 the bushel yield of wheat obtained per inch of seasonal rainfall was better than that obtained in any previous year, with one exception. The actual yield per acre was 24bush. 51lbs., and the seasonal rainfall 12.61in., so that 1bush. 58lbs. per inch of seasonal rainfall was obtained.* This figure was only once before exceeded, and that was in the abnormal year of 1914, when a yield of 11bush. 28lbs. was obtained on a seasonal rainfall of only 4.85in.

Thirdly, *in 1934 the actual yield per acre of 26bush. 57lbs. equalled the college record set up in 1920, on a seasonal rainfall of only 11.33in., so that the yield of 2bush. 22lbs. per inch of seasonal rainfall was a definite improvement on the previous year's figure of 1bush. 58lbs., and eclipsed the former record of 2bush. 21lbs. set up in 1914.*

Fourthly, *in 1935 a yield of 27bush. 59lbs. per acre was obtained, thus exceeding the previous actual highest yield by over 1bush. per acre.* The rainfall of 14.67in. for the period April-October was higher than in the two previous years, and the yield per inch of seasonal rainfall was slightly lower at 1bush. 55lbs., but even so was better than any year prior to 1933, except 1914. It is only fair to mention that these 1935 figures would have been much better had it not been for serious hail damage over an area of about 80 acres of crop.

ROSEWORTHY AGRICULTURAL COLLEGE.

Mean Wheat Yields, 1925-35, *Showing the Rapid Recovery in the Mean Yield in the Last Three Years.*

No. of Seasons.	Year.	Mean. Bush.	Mean. Lbs.
22	1925	17	25
23	1926	17	30
24	1927	17	26
25	1928	17	10
26	1929	17	5
27	1930	17	1
28	1931	17	7
29	1932	16	52
30	1933	17	8
31	1934	17	27
32	1935	17	46

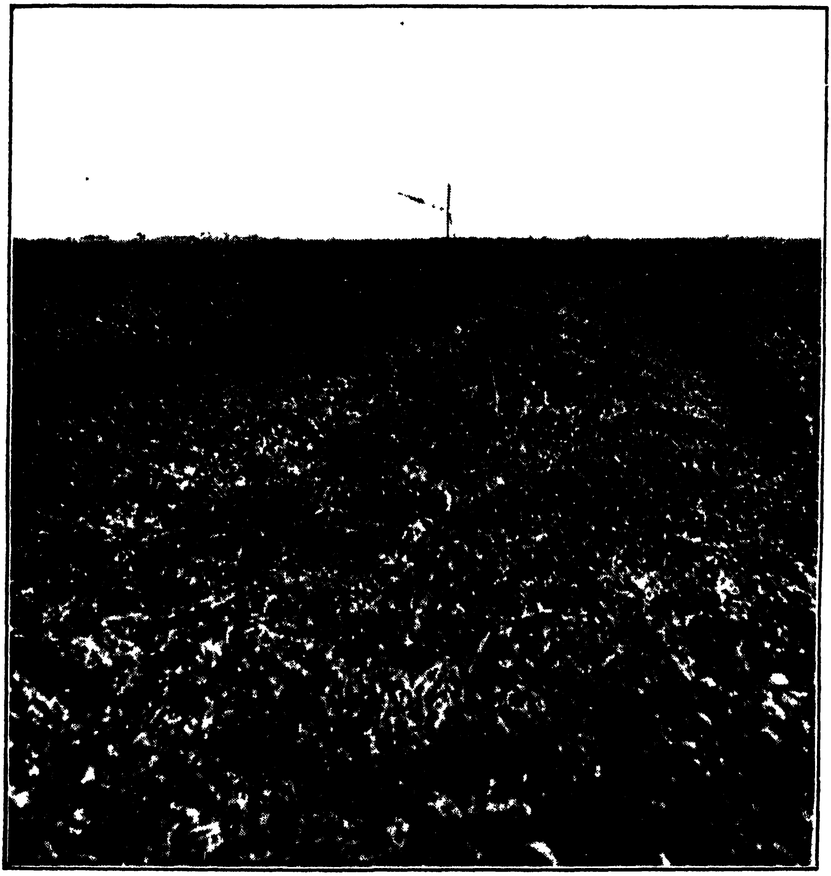
The hailstorm above referred to came as a very severe blow to our hopes in August when it swept, with great severity, across a magnificent crop of Sword, which had just begun vigorous upward growth. The crop was, to all intents and purposes, ruined, but being the only quantity of pure seed Sword on the farm it had to be left in its chaotic condition to make the best recovery it could. Omitting this hail damaged crop, with its low yield of 14bush. per acre, from the year's figures the average yield over the remaining areas was 30bush. 44lbs. Further, had the crop been unmolested and yielded as well as its early promise, the average yield undoubtedly would have been in the vicinity of 32bush. per acre. Such are the disappointments of farming!

LIVESTOCK AND THE CONSERVATION OF FODDER.

Wheat growing has been, and still is, the main undertaking of the college farm, but for many years livestock have played an important role. The importance of livestock in the development of a fully balanced agricultural system has called for, and has rightly received especial attention of late; in this respect the college has taken a strong lead and has emphasised repeatedly both the economic and agricultural advantages of combining stock raising with arable farming. The advocacy of such methods has been based on sound practical example and not on

An incredulous visitor knee-deep, and over, in Burr Medic and other volunteer growth (Fletts A). 1935 was an especially good fodder year; good rainfall, plus residual phosphate, sponsored a luxuriant growth on ley land, large quantities of which were ensiled.

any hypothetical or untried theory. The college farm at present is carrying the equivalent almost of one sheep to the acre in addition to 50 working horses, which are allowed for normal farm operations. This is a striking testimony to sound agricultural practice based on permanent methods, especially when it is considered that, of the total area of available land of just about 2,000 acres, between 500 and 600 acres are fallowed annually and about 800 acres are cropped, leaving only about 600 to 700 acres of pasture or ley land. For the last three years definite figures of all livestock carried have been translated into sheep per acre on the basis that all cattle, including cows in full milk and young animals, are the equivalent, on the average, of five sheep, and that each horse over and above the 50 allowed for the normal working of the property is equivalent to eight sheep. Those competent to judge will admit that these equivalents are on



A general view of Fletts A. after the mower had opened out for silage harvest on the 21st August, 1935. A veritable mat of Burr Medic was associated with self-sown Wheat and other volunteer growth. From 55 acres, 310 tons of green fodder were stacked as silage.

the conservative side and might well be slightly increased. In this way the livestock carrying capacity of the farm is assessed. Whether the final result is strictly accurate or not does not concern me, for the main consideration is to obtain annually comparable figures whereby a true reflection of each season's livestock activities will be obtained; ultimately, when a period of years is considered, a true index to the continuity of the carrying capacity will be possible.

The only means of assuring the continuity of carrying capacity in an environment such as Roseworthy, and South Australia in general, is to make adequate provision for the supply of feed during the periods of shortage which occur regularly every summer and autumn, and during the periods of shortage due to prolonged dry periods. It is definitely a case of making full, systematic, and adequate use of the years which provide a superabundance of feed; in these years it is fundamentally wrong to increase the stock on the property just because there is an abundance of feed. Continuity of returns from animal produce is a very significant consideration, for more often than not, the best markets are those which occur in times of feed shortage. The farmer able to meet the market regularly, and especially in time of such shortage, invariably reaps substantial benefit. To do this the only wise procedure is to settle down to a regular carrying capacity, feed reserve fodder when it is necessary, and take full advantage of the good seasons, not by the temporary palliative of increased stocking, but by the dependable system of conserving as much fodder as there is to spare.

The figures of the carrying capacity of the college farm for 1934 and 1935 given below represent a level which, it is hoped, will not fluctuate significantly year in and year out. To demonstrate this successfully a number of years is necessary, but indications are that the level is not too high.

ROSEWORTHY AGRICULTURAL COLLEGE.

Treatment of Farm Areas in Relation to the Livestock Carrying Capacity.

1933-35.

	1933. Acres.	1934. Acres.	1935. Acres.
Area fallowed	545	604	525
Area cropped	799	797	1,001
Area pasture, or ley land	635	578	453
Total area	1,979	1,979	1,979
Mean number of sheep	939	1,096	1,047
Mean number of cattle (including young stock)	99	90	91
Mean number of horses (including young stock)	78	92	91
Equivalent in sheep (after allowing for 50 working horses for farm operations)	1,703	1882	1,830
Sheep per acre	0.86	0.96	0.93

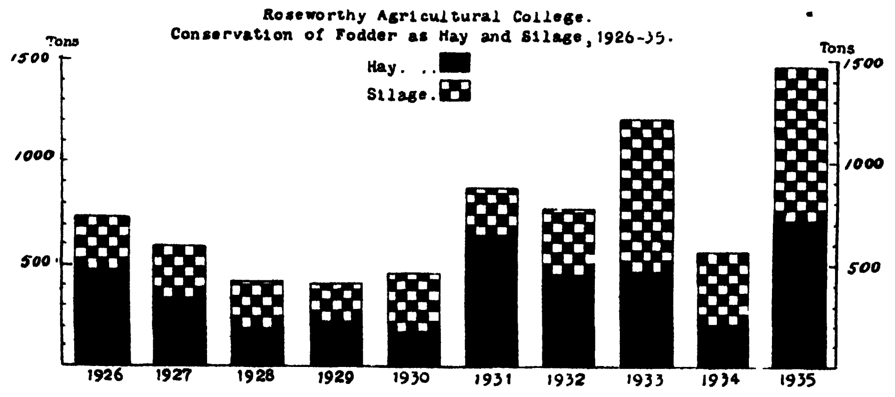
The last three seasons have given a wide variation, and while in 1933 large reserves were possible because of a particularly good feed year, 1934 was a year of feed shortage due to an excessively dry period in May, June, and July. So that for the year 1934 only normal yearly supplies of fodder could be gathered. Last year, again, fodder was particularly abundant, and every effort was made to put the reserve in a sound position. To this end 720 tons of hay and 749 tons of greenfeed as silage were conserved, making a total of 1,469 tons of roughage handled.

ROSEWORTHY AGRICULTURAL COLLEGE.

Conservation of Fodder as Hay and Silage for the Decade 1926-35.

Season.	Hay Made. Tons.	Silage Made. Tons.	Total Roughage Conserved. Tons.
1926	471	264	735
1927	336	261	597
1928	196	220	416
1929	222	189	411
1930	178	286	464
1931	653	219	872
1932	467	305	772
1933	480	730	1,210
1934	207	356	563
1935	720	749	1,469

The accompanying figures, which are the basis for Graph IV., record the fodder reserves gathered over the last decade. The policy for increasing work with livestock is evident from the figures given for the last three years. Both 1933 and 1935 represent two big harvest years from the point of view of fodder conservation, and at the end of the 1935 season there were sufficient reserves on hand to maintain the college livestock carrying capacity on an even keel until October, 1938, provided average, or even a little below average, conditions prevail.



GRAPH IV.—The conservation of roughage as Hay and Silage at the College over the last decade is illustrated herein. Note the general increase in fodder conserved and especially the substantial tonnages made in the good fodder years of 1933 and 1935.

I have endeavoured in this outline to portray the success and development in two of the most important general undertakings of the college farm, and, in doing so, I have shown the results of 1935 and the two previous seasons in the full perspective of results obtained in previous years. The difficulty in handling recorded data extending over long periods is to make the matter interesting; I offer this as an excuse for not elaborating more fully on specific results, and for not burdening the text with results of lesser significance. The general aim has been to introduce the results obtained on the farm in 1935, details of which will be given in subsequent articles. A general word picture of standards previously attained lends colour to the year's work in which a record wheat yield was obtained, and more produce was gathered from the farm in the form of grain, hay, and silage than any other year in the history of the college. The season was favourable, with rainfall slightly above average; in other words, growth conditions for crops and fodder were better than usual. The fact of greatest practical importance, however, is that full advantage of the favourable season was taken, the management of the farm being directed to this end.

THE REMOVAL OF SEEPAGE WATERS BY PLANT GROWTH.

[By F. R. ARNDT, Horticultural Instructor, Upper Murray Irrigation Areas.]

(A paper read at the Conference of River Murray Branches of the Agricultural Bureau, held at Renmark, 18th June, 1936.)

In a paper on Irrigation and Drainage read by the writer at the last Conference of the River Murray Branches of the Agricultural Bureau, held at Moorook last June, mention was made of the beneficial results that have often been obtained by the growing of moisture-loving plants for the removal of surplus soil water from irrigated lands. In the present paper it is intended to elaborate upon this subject, and to show how plant growth may in many ways be utilised to help to combat the seepage menace.

In the first place it must be realised that in places where the seepage problem has obtained formidable dimensions and large volumes of free water have accumulated, conditions may often be impossible for the growing of plants of any kind, and in such cases only drainage can be effective.

Vineyard destroyed by heavy concentration of salt.

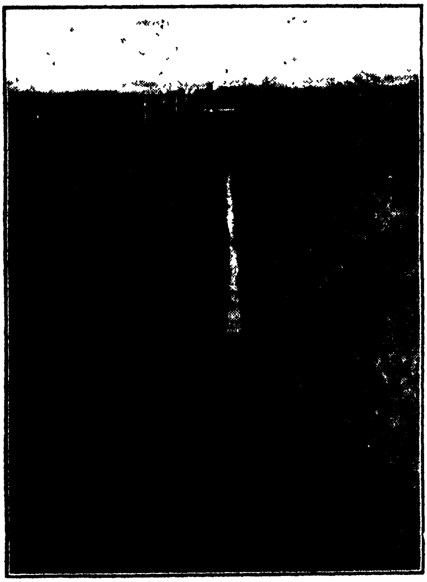
Notable instances of such large accumulations of free water can be found in regard to the two artificial lakes that have been formed by drainage waters in the Berri and Barmera areas, while at a number of other places the land has been allowed to become so badly waterlogged—with the consequent accumulation of injurious salts in the surface layers of the soil—that plants will not grow thereon. In such cases it is apparent that only drainage or pumping will be effective in removing the vast accumulation of seepage waters that has taken place.

As, however, badly affected seepage areas of any great extent are usually due to the accumulation of the combined drainage waters from a number of holdings, something may often be done to lessen the volume of underground waters at their source, so as to ease the seepage problem of the affected areas, and it is here that the growing of moisture-loving plants may be of considerable help.

THE TASK OF THE INDIVIDUAL IRRIGATIONIST.

The first care of every irrigationist should be, of course, the efficient use of his irrigation water. Good irrigation practice demands that every plant should as nearly as possible receive the same amount of water and that there should be no overwatering of the land.

Experience reveals the fact that such is usually not the case, even where care is exercised in watering, because the imperfections inherent in the furrow system of irrigation, by which means most orchards and vineyards are watered, makes an even watering practically impossible. The excess water received at the beginning of the irrigation runs (which portion of the plantation receives the most water) soaking down deeply into the subsoil is a prolific cause of seepage. However, seepage troubles and a general rise in the watertable can also be brought about by the flooding system of watering if an excessive amount of water is applied to the land.



Drain for the removal of seepage waters in course of construction.

The irrigationist has to be ever vigilant in regard to the watering of his land and do all in his power to avoid the bringing on of seepage. Should he find that this is developing on his holding, then he must lose no time in combating it before the menace becomes serious.

THE REMOVAL OF SURPLUS WATER BY PLANT GROWTH.

That plants of all kinds remove a considerable amount of moisture from the soil by means of transpiration through their foliage has been known for a long time, but it is only within comparatively recent years that attempts have been made to make use of the growing of plants for the drying out of seepage lands. Plants that may be grown for this purpose consist of various kinds of trees, shrubs, grasses, and other plant varieties. Fodder plants such as lucerne, Japanese millet, Sudan grass, and barley have been the ones chiefly used, but larger plants may also be of value in many cases.

TREES AND SHRUBS AS DEWATERING AGENCIES.

At some of the irrigation settlements trees of various kinds have been planted along the banks of the earth channels to absorb the surplus moisture seeping through them, and often these have been of considerable help in minimising the seepage troubles arising from that source. The trees that have been chiefly grown for this purpose consist of gums, willows, poplars, tamarisks, and palms of various kinds.

Of these, the willow is the most moisture loving, as it will grow with its roots in water, but being deciduous is effective in transpiring moisture only during the summer months.

Date Palms growing on salt impregnated land.

Palms of most kinds are also great lovers of water, and some are highly tolerant to saline conditions as well. Of these, the Date palm (*Phoenix dactylifera*) is probably one of the most salt resistant plants in Nature, as it will grow in situations where, owing to the salinity of the soil, most other plants fail to live. That the Date palm requires for its best development copious supplies of water, as well as a considerable amount of salt in the soil, has long been recognised, and in this connection it is interesting to note that the ancient Greek historian (Herodotus), in describing the conditions existing in the irrigated lands of Babylonia at his time (about 400 B.C.), says that the chief plant varieties grown in that country consisted of Date palms and barley—two highly salt-resistant plants—indicating that the irrigationists of those days probably had their salt troubles also and found that these plants suited their conditions best.

Other plants that have at times been used as dewatering agencies are Pampas grass and bamboos, which have the capacity of growing in wet situations and transpiring large quantities of water.

REMOVAL OF SURPLUS SOIL MOISTURE BY FODDERS.

As previously mentioned, fodder plants have been the ones chiefly used to absorb the surplus moisture from seepage lands. The growing of these plants serves a double purpose, as not only are they of value in drying out the soil, but they serve as stock food as well.

The variety chiefly grown here has been lucerne, which, on account of its deep rooting system and its great capacity to absorb large quantities of water, has been very valuable in this respect. Other varieties used to a lesser extent include barley on account of its great salt resistance, and such summer-growing fodders as Japanese millet, Sudan grass, and maize.

VALUE OF LUCERNE.

As just stated, lucerne has proved to be the most valuable of the fodders as a dewatering plant. There are, however, situations in which it will not thrive, such as on lands where free water is close to the surface of the ground (which should be drained) or where the surface layers of the soil are highly impregnated with salt, where barley should be tried as a first crop. On other moist situations, where it has been well planted and looked after, lucerne has given highly beneficial results in the drying out of the land.

Lucerne growing among young Orange trees.

During the past three or four years the writer has been advising growers who have fruit trees or vines suffering from excessive soil moisture to interplant with strips of lucerne, and young and mature citrus trees, fig trees, and various kinds of vines have been so treated. The results have been generally satisfactory, and in one instance a watertable existing on land planted with fig and orange trees was in two years reduced from 2ft. 6in. to about 6ft., and the trees were greatly improved in health thereby.

A remarkable instance of deep rooting and water absorbing capacity of lucerne came under the writer's notice some time ago. It was related in the paper upon this subject at last year's Conference, but is worth repeating here. This was to the effect that a leading Berri fruitgrower, who had put down a tile drain, which was working well, removed a row of weak trees situated parallel to and above it, and in its place planted a 12ft. strip of lucerne. The result was that although the lucerne was not planted near enough for its roots to enter the drainage pipes, yet after it was established the drain stopped running, showing that the rooting system of the lucerne intercepted and absorbed the water as this drained down the slope along the subsoil.

LUCERNE IN PLACE OF TILE DRAINS.

From the foregoing examples it is apparent that the growing of strips of lucerne may in many places be as effective in lowering the watertable of seepage lands as a system of tile drains. Moreover, in planting lucerne not nearly so much expense is incurred as in putting down tile drains, and, in addition, a valuable fodder is secured.

THE DRAINAGE OF HEAVY SOILS.

On certain soil types of a firm nature, such as exist on portions of the river flat lands of the Renmark and Block E districts, and to a lesser extent on the Berri and Cobdogla Irrigation Areas, drainage is naturally much slower than on soils of a more porous nature. Hence, where waterlogging of the subsoil has taken place on such lands, for tile drains to be effective they have to be closer to each other than would be the case where the soil was looser in texture. If tile drains gave satisfactory drainage on sandy land at, say, 2 chains apart, then on heavier land to give the same results they may have to be half that distance from each other, or even less. The writer has known a tile drain situated in heavy clay soil that was draining the water for only 12ft. on either side of it.

Owing to its great cost effective tile drainage on soils of this nature often may not be an economic proposition, and it is here where the growing of lucerne may be of the greatest value. The lucerne can be grown in strips along the rows of fruit trees and vines, and on land where the previous plant occupants have failed. Once it is established the lucerne should be watered very sparingly, so as to force it to utilise as much of the surplus soil moisture as possible, and thereby lower the watertable.

DRAINAGE OF LOW-LYING LANDS.

Another class of land on which seepage troubles are difficult to combat is that which is situated in low-lying valleys or depressions, from which it is at times exceedingly difficult to remove the accumulated drainage waters, even if the land is drained. In such situations wells are usually put down until a layer of drift sand is reached, and the drains are led into these.

Where this underground layer of sand is of very large dimensions, or leads directly into the river valley, the drainage waters can be successfully removed, but often the wells lead only into comparatively small sand deposits, which in time either fill with water and so are rendered useless for drainage purposes, or drain so slowly that after an irrigation they temporarily fill up, and for a time cause the drainage pipes to remain filled with water, to the detriment of the plants growing near them.

In such cases, also, the growing of strips of lucerne along the fruit tree and vine rows, or in other situations, will give beneficial results, as the lucerne, by transpiration through its foliage, will remove much of the surplus moisture from the soil and so prevent undue concentration at any one place.

WINTER COVER CROPS.

On a large number of irrigated holdings the growing of winter cover crops. chiefly of a leguminous nature for green manure, is now an annual practice. Besides adding to the fertility of the land, such plants will absorb a considerable quantity of soil moisture and so help to dry out moist land if this is not overwatered.

There has, however, been a tendency among a large number of growers to apply large quantities of water to their cover crops in order to promote a good stand of herbage to plough under in early spring, with the result that in many cases more water has been applied than the plants can absorb. Unless the drainage of the land is very good, this surplus water will lead to the waterlogging of the subsoil on level land, or where the country is undulating will soak along the subsoil from the higher to the lower areas and bring about seepage there.

It is a dangerous practice to apply heavy and frequent irrigations to cover crops, and in a normal season one good autumn watering should be sufficient to give the plants a good start, leaving the winter rains to carry them on. The application of as many as three special irrigations in a season for the growing of cover crops, as has at times been practised, is certainly a mistake, and if persisted in can only lead to drainage trouble.

Cover Crop growing in between vine rows.

It is the writer's opinion that many of the seepage troubles that have arisen within recent years have either been brought on, or accentuated, by the too heavy watering of cover crops, and lighter waterings of these crops must be practised in the future if the seepage menace is to be kept in check.

CONTROL OF SOIL MOISTURE BY PLANT GROWTH.

For the best results to be obtained from the growing of plants for the reduction of the surplus moisture in the soil, it is necessary that the work should be carried out in a systematic manner, the writer believes that beneficial results would follow if some such procedure as the following was adopted by irrigationists:—

(1) In moist situations in orchards and vineyards, where the soil is not too saline for lucerne to grow, strips of this plant should be planted along the fruit tree and vine rows. These strips should be from 4ft. to 6ft. wide among vine rows and about double that width in between fruit tree rows where there is sufficient room. For bad cases of seepage lucerne should be planted in every row, but where the trouble is less serious the planting of every other row should be sufficient.

(2) The lucerne should be regularly watered until it is established, after which, unless suffering from drought, but little water should be directly applied to it, so that the plants are compelled to absorb as much of the surplus soil moisture as possible. The lucerne should be encouraged to make good growth by regular cutting and by an annual application of 2cwts. to 3cwts. of superphosphate per acre, as the more it can be induced to grow the more moisture will it remove from the soil.

(3) As has been previously stated, where the land is too saline to grow lucerne, barley as a winter and Japanese millet as a summer crop should be tried. As these fodders absorb considerable quantities of salt, the growth should be cut and carted off the land and fed elsewhere, so that the amount of salt in the soil may be reduced thereby. After several years of this treatment sufficient salt may have been removed from the soil to enable the land to grow lucerne successfully.

(4) In watering trees and vines interplanted with lucerne or other fodders, the water should be applied close to the fruit varieties so that the salt in the soil may be leached downwards and sideways away from them. As the lucerne, in drying out the land, may leave a concentration of salt in the surface layers of the soil, it may at times be necessary to give the fruit trees and vines, and even the lucerne, comparatively heavy surface waterings to leach the salt down into the subsoil beyond their root systems.

(5) On lands which show a tendency to develop seepage it is also a good practice to plant the headlands and footlands with lucerne to help to keep down the watertable. This is especially desirable where there are double headlands, due to channels running through the middle of the holding and where large quantities of water are consequently absorbed by the land. The spreading of the lucerne around fruit trees and under vine trellis can be prevented if good tillage operations are practised.

(6) Very often it may not be sufficient to plant only the moist places with lucerne, as the surplus soil moisture often comes from higher levels, and is at times so copious as to prevent any satisfactory plant growth in low-lying areas. In such cases if one or more strips of lucerne are planted higher up the slope where no seepage is apparent, the surplus soil moisture in soaking along the subsoil is intercepted by the deeply growing lucerne roots, and so is dissipated into the atmosphere through the plant foliage.

To have a plot of sufficient size for this purpose sometimes it may be necessary to remove a row of fruit trees or vines. This, however, will not result in loss if the seepage trouble is conquered. Practically all irrigationists grow lucerne for stock food, and it is best to have this growing where it will do drainage work as well.

Although in the reclamation of seepage lands tile drainage has, and will, continue to play an important part, especially where large accumulations of drainage waters have taken place, the growing of moisture-loving plants, especially lucerne, if judically used, is of the greatest help in overcoming the seepage menace.

The chief advantage of the growing of plants for this purpose lies in the fact that by their absorption of the surplus water as this moves along the subsoil, the excessive accumulations of drainage waters are prevented from taking place in situations that would otherwise be liable to seepage, and so make the laying down of costly tile drainage systems unnecessary.

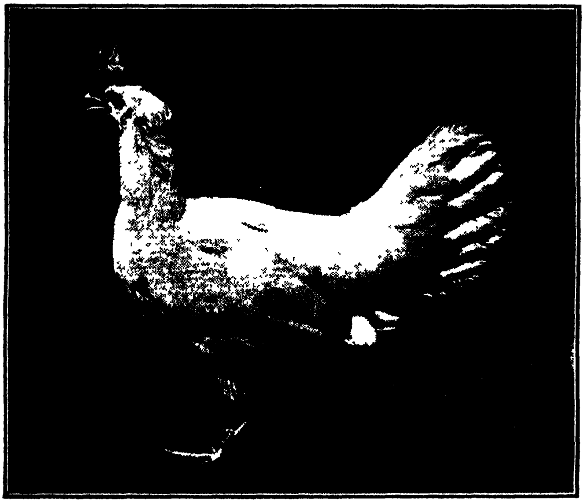
It is therefore reasonable to suppose that if the irrigationists of the Murray Valley were to take up the planting of the deeply rooting lucerne plant in a systematic manner, the seepage menace would in many cases either be checked or entirely overcome, and the development of serious drainage troubles in the future would be prevented.

PARAFIELD EGG-LAYING COMPETITION, 1935-36.

[A general review of the Competition by C. F. ANDERSON (Government Poultry Expert).]

The Third Egg-laying Competition in which the weighing of each egg throughout the currency of the test was practised terminated at Parafield on the 31st March, 1936. As in all Egg-laying Competitions conducted at Parafield Poultry Station, the test covered the full period of the year commencing on the 1st April, and terminated on the 31st March following.

As the results of this method of egg weighing are more closely studied it is realised that the system adopted at Parafield Poultry Station constitutes the only method of making a definite and accurate record of the weighing of eggs. The maintenance of egg size is especially important in a State like South Australia, where a very big proportion of the production has to be marketed overseas during certain months of the year and interstate during other portions of the year.



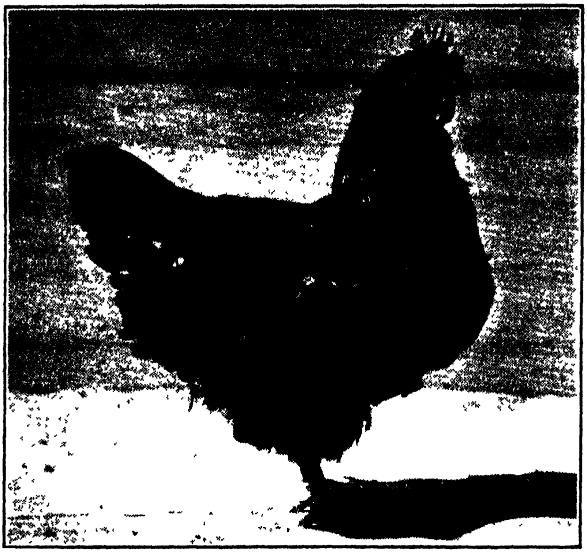
Highest Score in Competition—247 first-grade Eggs. White Leghorn Pullet, owned by Mr. H C. Stacey, Meadows.

It is generally found, too, that where the size of the egg is maintained with a 2oz. average after the birds have been in production for two to three months, the size and stamina of the stock, hatching, and rearing are of the high standard necessary for successful poultry keeping. In flocks where it is noticed that the size of the egg is definitely on the down grade, it will be found that the size of the bird is also smaller, with a general tendency towards a hereditary weakness in the progeny of that stock.

Further, the practice of weighing each egg has overcome many objections that competitors have to the block system of weighing. Prior to the introduction of this practice at Parafield, it was the custom to weigh all eggs during the month of July, and any bird which did not produce 66 per cent. of 2oz. eggs during the month of July was disqualified. This was a hardship to quite a number of competitors, in as much as that the birds which commenced laying steadily early in the test continued that production during April, May, and June, and frequently went into a light moult during July, with the result that they laid very few eggs during that period. It is well known in poultry breeding that, during a sequence of laying, the last eggs definitely show a decrease in weight, with a result that the method of weighing during the month of July meant that a number of good birds were disqualified.

Again, we frequently met the case of a very poor layer with four or five eggs to its credit during the month of July, but in many instances those eggs would weigh the required 2ozs., and the bird would be eligible to remain in the competition. These circumstances often resulted in discontent, and more or less suspicion among a number of competitors, but with the individual weighing of all eggs all this suspicion is removed, and the bird is only credited with the number of first-grade eggs.

In order not to penalise unduly the breeding of birds that will lay a reasonable number of first-grade eggs, the weighing has been arranged so that for the first two months of the test—that is, from the 1st April to the 31st May—a weight of 1¾ozs. is the minimum for first-grade eggs from the 1st to the 30th June 1⅞ozs. is the minimum for first-grade eggs, and from the 1st July to the 31st March the minimum is 2ozs. This gives the birds an opportunity of gradually reaching a production of the average 2oz. egg, while at the same time avoiding any undue strain in producing the full size 2oz. egg from the commencement of laying. Although this may be the aim of some breeders, I consider that from a commercial aspect it is more or less an ideal.



The Leading Black Orpington—233 first-grade Eggs.
Owned by Mr. J. Pennack, Pooraka.

The study of the results of Egg-laying Competitions will show that a big percentage of the mortality is due to straining in the early period of production, and keeping to the standard minimum 2ozs. from the commencement of laying undoubtedly accentuates this trouble.

Again, it should be kept in mind that birds invariably lay a bigger egg during the second and third year of production. Therefore, birds which come to the production of a 2oz. egg at the commencement of laying in their first laying period would probably increase that size to 2⅛oz. or 2¼oz. eggs during the second and third laying period, and it is extremely doubtful whether there is any commercial advantage in this aspect.

A study of the local marketing conditions and also the demand from overseas show that the definite preference is for the 15lb. pack, which is the average 2oz. egg. As export packing in South Australia does not seriously commence until July it should be the aim of producers to breed for the production of the 2oz. egg early in that month.

All eggs were collected at Parafield twice daily, at 11 a.m. and 4 p.m., and were weighed immediately following collection.

Poultry breeders supported the Competition well with the following number of birds:—

1935-36 *PARAFIELD EGG-LAYING COMPETITION.*

SECTION 1.—*Wet Mash.*

Class	Breed	No. of Entries.	
1.	White Leghorns	306	
2.	Any other light breed	6	
3.	Black Orpingtons	45	
4.	Any other heavy breed	36	
		—	393

SECTION 2.—*Dry Mash.*

Class	Breed	No. of Entries.	
5.	White Leghorns	18	
6.	Any other light breed	(no entries)	
7.	Black Orpingtons	3	
8.	Any other heavy breed	3	
		—	24

HOME PROJECT UTILITY SECTION.—*Wet Mash.*

Class 9.		
White Leghorns	24	
Black Orpingtons	10	
Rhode Island Reds	3	
Minorca	1	
	—	38
		455

It is interesting to note the increase in the number of entries received for the Home Project Utility Section. This section is available to scholars at the public schools who take up poultry as their home project, and it is indeed pleasing to see the increased interest which is being taken by the scholars in this particular work. Ultimately this must be of benefit to the poultry industry, particularly in the country districts where the majority of entries in this section comes from. Some of the scholars who have practised poultry as their home project are making very definite headway with poultry keeping as a means of livelihood, and there are already several boys in various parts of the State, who have graduated through the Home Project Class, with fine flocks of birds.

WINTER TEST.

The practice as adopted in previous competitions conducted at Parafield Poultry Station was again followed in the Competition under review, *i.e.,* Certificates were given to the birds which laid the highest number of first-grade eggs during the period from the 1st April to the 31st July, or 122 days. The winter test is one the importance of which should not be overlooked by poultry breeders. It should be understood that the egg-laying year is accepted in the poultry world as being from 1st April to the 31st March, and it is essential for a bird to record a reasonable score during the winter period to have any chance of a good score for the 12 months.

I believe that during the last few years when mass production of poultry has been practised, the importance of reasonable winter egg production has been overlooked. During the last five or six years, when there has been a good demand for day-old chicks, stock, &c., a number of breeders have turned their minds to the supply of this class of stock, and have placed the average egg production more or less as a secondary consideration. However, this state of affairs cannot continue indefinitely, as after all the stability of the poultry industry in South Australia depends on the returns received from egg production, and it is along these lines that the testing and breeding of stock must follow. The following table shows the leading birds in each section during the winter test:—

FIRST GRADE EGGS ONLY—WINTER TEST.

1st April, 1935, to 31st July, 1935 (122 days.)

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns.

Singles—	Eggs Laid.	Bird Nos.
E. McKee	82	29
E. McKee	79	28
E. McKee	79	27
H. C. Stacy	79	36
Trios—		
E. McKee	227	28-30
E. McKee	214	25-27
W. H. A. Hodgson	188	298-300
Teams—		
E. McKee	441	25-30
C. R. Wharton	345	127-132
W. Sickert	339	169-174

Class No. 2.—Any other Light Breed.

Singles—		
A. Heaysman (Cuckoo Leghorn)	72	323
Langmaid and Bettison (Black Minorca)	59	321

Class No. 3.—Black Orpingtons.

Singles—		
A. G. Dawes	77	327
K. Pennack	67	337
K. Pennack	61	340
Trios—		
K. Pennack	134	337-339
H. J. Mills	132	331-333
K. Pennack	130	340-342
Teams—		
K. Pennack	264	337-342
A. G. Dawes	242	325-330
H. J. Mills	217	331-336

Class 4.—Any other Heavy Breed.

Singles—		
H. J. Mills (Rhode Island Red)	88	364
V. F. Gameau (Rhode Island Red)	71	381
K. Pennack	68	390
Trios—		
K. Pennack (Barnvelder)	166	388-390
V. F. Gameau (Rhode Island Red)	154	379-381
H. J. Mills (Rhode Island Red—two birds only competing)	148	364-366
Teams—		
V. F. Gameau (Rhode Island Red)	264	379-384
K. Pennack (Barnvelder)	267	385-390
A. G. Dawes (Rhode Island Red)	202	367-372

SECTION 2.—DRY MASH.

Class No. 5.—White Leghorns.

Singles—

G. R. Cowell	59	391
A. J. Monkhouse	52	402
G. R. Cowell	50	396

Trios—

A. J. Monkhouse	122	400-402
A. J. Monkhouse	121	397-399

Teams—

A. J. Monkhouse	243	397-402
G. R. Cowell	183	403-408

Class No. 6.—Black Orpingtons.

Singles—

W. R. Christie	45	409

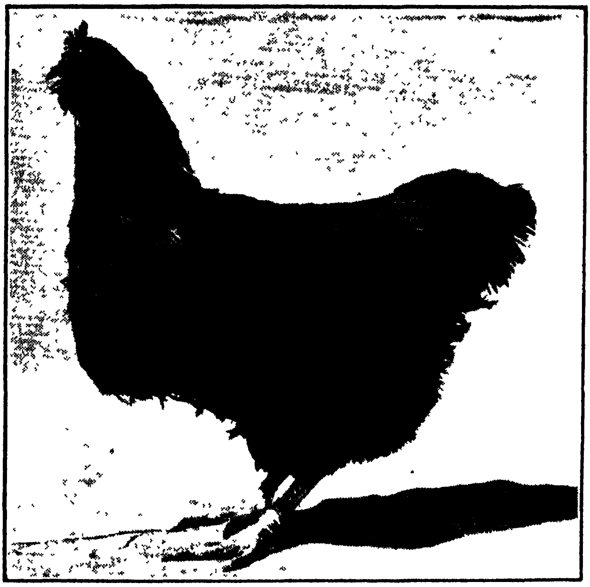
Class No. 8.—Any Other Heavy Breed.

W. R. Christie	48	414

SECTION 3.—WET MASH.

Singles—

Olive Pitman, Gilles Plains (Black Orpington)	78	439
Lyol Stone, Morphett Vale (Black Orpington)	72	443
Peter Western, Ascot Park (White Leghorn)	71	415
Eric Pratt, Abattoirs (White Leghorn)	71	434
Malcolm Booth, Bridgewater (Black Orpington)	70	445



Rhode Island Red, the Winning Bird of "Any other heavy breed" section—218 first-grade Eggs. Entered by Mr. H. J. Mills, Edwardstown.

FEEDING.

The Competition was divided into two sections, one for Wet Mash and the other for Dry Mash. The Home Project Utility Section was Wet Mash; 431 birds were entered in the Wet Mash sections, and 24 in the Dry Mash section. As results in previous tests have shown, the leading scores in the Wet Mash sections are again in advance of those of the Dry Mash section. I have pointed out similar differences in previous Competitions conducted at Parafield. The competition results with regard to Wet and Dry Mash feeding also support the difference in results in experimental work conducted at Parafield.

The Wet Mash section was fed at approximately 7 a.m., and the method adopted was as follows:—Equal parts by weight of bran, pollard, and wholemeal, 1lb. of meat meal, and ½lb. linseed per 100 birds. The linseed meal was fed from the commencement of the test to 30th September, when it was dropped for the remaining period of the test. Greenfeed was added to the mash in proportions varying from 40 per cent. to 60 per cent. according to the season. Wheat was fed at midday and again at night on the basis of 1oz. at midday and 1oz. at night. The proportions of food in the Dry Mash were the same as those in the Wet Mash.

The Dry Mash was fed daily at 7.30 a.m., and at 10 a.m. greenfeed was given separately for Dry Mash birds.

The following table indicates the average monthly price of the various foodstuffs fed to the birds. These prices are on the basis of delivery at Parafield Poultry Station, and are those at which the average commercial egg producer is able to obtain his requirements:—

Average Monthly Prices of Foodstuffs.

Month.	Wheat Bush.	Bran per Ton.	Pollard per Ton.	Wholemeal per 60lbs.	Meat-meal per Ton.	Onions per Cwt.	Linseed meal per Ton.
1935.	*s. d.*	£ *s. d.*	£ *s. d.*	*s. d.*	£ *s. d.*	*s. d.*	£ *s. d.*
April	3 3½	5 0 0	5 2 6	3 4	13 0 0	4 0	10 5 0
May	3 3½	5 0 0	5 2 6	3 6	13 0 0	8 0	10 5 0
June	3 3	5 0 0	5 2 6	3 4½	13 0 0	6 2	10 5 0
July	3 3	5 0 0	5 2 6	3 2	13 0 0	8 4	10 5 0
August	3 3	5 0 0	5 2 6	3 8	13 0 0	5 0	10 5 0
September .	3 3	5 7 6	5 12 6	3 8	13 0 0	5 0	10 5 0
October	3 11	5 7 6	5 12 6	3 11	13 0 0	6 0	10 5 0
November ..	3 3	5 2 6	5 7 6	3 9	13 0 0	6 6	10 5 0
December ..	3 6	5 2 6	5 7 6	3 9½	13 0 0	6 0	10 5 0
1936.							
January ...	3 8	5 10 0	5 10 0	4 1	13 0 0	6 0	10 5 0
February ..	3 8	5 12 6	5 12 6	4 2	13 0 0	6 2	10 5 0
March	3 6	5 7 6	5 7 6	4 0	13 0 0	5 0	10 5 0
	Av. Price.	Av. Price.	Av. Price.	Av. Price.	Av. Price.	Av. price	Av. Price.
	s. d.	£ *s. d.*	£ *s. d.*	*s. d.*	£ *s. d.*	*s. d.*	£ *s. d.*
	3 5·08	5 4 2	5 6 10½	3 8·41	13 0 0	6 0·16	10 5 0

The average cost of feeding per bird was 5s. 2d., which is a little higher than the 1934-35 test, when the cost was 4s. 8d. per bird.

PRICES RECEIVED FOR EGGS.

For the benefit of poultry keepers, and also of students of Egg-laying Competition results, the practice of publishing the monthly prices received for eggs is again followed. This table is one of the most interesting of the Competition series. The returns are published on a monthly basis, because that is the basis on which the eggs are sold.

It is again pleasing to see that, during the months of big production, *i.e.*, July to October, satisfactory prices were received, and from studying these figures poultry keepers will be assured that the prices for those months are practically overseas parity, for almost the bulk of the eggs during that period were sold overseas.

Once again I would point out the weakness in the present marketing system, as when production is falling rapidly—that is December and January--and the feeding costs are at their highest for the reason that the young stock are maturing rapidly at this period of the year, prices during these months show a downward tendency. This emphasises, as every test conducted in this State has shown, that the weakness in the egg-marketing position is during the months of December, January, and February. It should be the endeavour of all those actively connected with egg marketing to look for some other markets or some method of stabilising the market for those three months of the year. I believe that, in the near future, some system of market stabilisation will be essential if the industry is to progress from a State point of view.

The following table shows the monthly price received. The average price for the year for eggs 1⅞ozs. in weight and over was 1s. 0.31d. per dozen, as compared with 11.22d. for the year 1934-35, whilst the average price for 1¾oz. eggs was 10.43d. as compared with 9.12d. for 1934-35 test.

Monthly Price Received.

Month.	1⅞ozs. and over	1¾ozs.
	Per doz. *s.* *d.*	Per doz. *s.* *d.*
April, 1935	1 3	1 0¼
May, 1935	1 5½	1 3½
June, 1935	1 1¼	1 0¼
July, 1935	1 0¼	0 11
August 1935	1 0¼	0 10¼
September, 1935	1 0¾	0 11
October, 1935	1 0¾	0 11
November, 1935	0 10¾	0 8¼
December, 1935	0 8¾	0 7
January, 1936	0 9¼	0 7¾
February, 1936	0 11	0 9
March, 1936	1 0¼	0 10
	Average price. 1s. 0·31d. per doz.	Average price 10·43d. per doz.

Profit Over Cost of Feeding.

The profit over cost of feeding should be considered satisfactory. I would, however, point out to those who follow the results closely, that it should be kept in mind that the competition birds are received at Parafield almost on the point of laying, and breeders must realise that there are feeding and rearing costs to be considered up to the time the birds commence production at the Competition. Many breeders, especially those just coming into the industry, are apt to overlook this fact.

Again, it must be understood that the birds are only kept at the Competition for their first laying year, which should be the most profitable year of their production. Further, in estimating costs of feeding and returns on the commercial farm, one must realise that the returns of laying birds for the second and third laying year are lower than they are during the first year of production.

All returns are slightly higher than the cost in the 1934-35 Competition, and it is to be hoped that these are indications of better prices for poultry breeders. The average return per bird was 15s. 5d., the cost of feeding 5s. 2d., leaving a return over cost of feeding of 10s. 3d. per bird for the full 12 months.

It is interesting to study the results since the commencement of the present system of individual weighing of eggs, that is, during the last three competitions:—

	1933-34.	1934-35.	1935-36.
Cost of feeding	4s. 6d.	4s. 8d.	5s. 2d.
Average price for eggs—			
1⅞ozs. and over	11·80d.	11·22d.	1s. 0·31d.
1¾ozs.	9·77d.	9·12d.	10·43d.
Return over cost of feeding	6s. 5½d.	9s. 8d.	10s. 2d.
Average number of eggs laid by competing birds	140	191·5	185·27

The low average for 1933-34 competition was due to the fact that this was the first year that the individual weighing of eggs was practised, and the breeders probably aimed at a lower egg production with the object of being reasonably sure of the weight of the eggs.

Home Project Utility Section Winning Bird, owned by Eric Pratt, of Abattoirs. Winning score, 240 first-grade Eggs. The same section was won by the same winner last year.

The next table is the most important of all, because it shows the total number of eggs laid by each bird, the number of first-grade eggs, and the number of second-grade eggs, together with the average of all eggs laid by birds which completed the test. In studying this table it will be seen that the White Leghorns produced the highest average number of eggs. During the previous two tests the Black Orpingtons won the pride of place, but they have dropped back from the average of 203 eggs in the 1934-35 test to an average of 182 eggs for the 1935-36 test. Barnevelders have again shown that almost all the eggs they produce are first grade eggs—from a total of 1,016 eggs laid, only 17 were second grade.

MORTALITY.

Mortality has shown a decided decrease on that of the previous test. This, however, may be due largely to the cool summer experienced during the competition with hardly a day when the birds were in any way distressed owing to heat, while in previous tests, owing to long heat waves, losses due to heat have been unavoidable. During the currency of the test 28 birds died from a total of 455 birds entered. This is equavalent to 6.15 per cent., and should be considered very satisfactory.

In the various breeds the death rate was as follows:—White Leghorns, 23 birds from 348 competing; Black Orpingtons, 2 birds from 58 competing; Rhode Island Reds, 3 birds from 36 competing. In the Minorcas, Cuckoo Leghorns, and Barnevelders no deaths were recorded.

Class.	No. Birds	Breed.	1st Grade Eggs Laid.	2nd Grade Eggs Laid.	Total Eggs Laid.	Average No. 1st Grade Eggs.	Average No. 2nd Grade Eggs.	Average all Eggs Laid.
1	286	White Leghorns....................	46,385	8,526	54,911	162·18	29·81	192·00
2	3	Minorcas	392	39	431	130·66	13·00	143·66
2	3	Cuckoo Leghorns..................	556	4	560	185·33	1·33	186·66
3	44	Black Orpingtons	6,120	1,893	8,013	139·09	43·02	182·11
4	6	Barnevelders	999	17	1,016	166·50	2·83	169·33
4	27	Rhode Island Reds	3,220	492	3,712	119·25	18·22	137·48
5	16	White Leghorns (dry mash)	2,322	716	3,038	145·12	44·75	189·87
7	3	Black Orpingtons (dry mash)	431	102	533	143·66	34·00	177·66
8	3	Rhode Island Reds	390	153	543	130·00	51·00	181·00
9	36	Mixed Breeds	5,804	551	6,355	161·22	15·30	176·52
	427		66,619	12,493	79,112			

Average No. First grade eggs laid by all birds that completed test, 156·01
Average No. Second grade eggs laid by all birds that completed test, 29·25
Average No. All eggs laid by all birds that completed test. 185·27.

The following are the winning scores in each section:—

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1935-36, *CONDUCTED AT PARAFIELD POULTRY STATION.*

FINAL SCORES FOR THE YEAR ENDED 31ST MARCH, 1936.—FIRST GRADE EGGS ONLY.

SECTION 1.—WET MASH.

Class 1.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
H. C. Stacy	247	36
A. Jarvis	246	252
J. J. Devlin	245	207
Trios—		
V. E. Williams	689	313-315
E. McKee	665	28-30
B. C. Sanders	651	157-159
C. R. Wharton	651	127-129
Teams—		
J. J. Devlin	1,237	205-210
C. R. Wharton	1,232	127-132
S. Hill	1,212	85-90

Class 2.—*Any other Light Breed.*

Singles—		
A. Heaysman (Cuckoo Leghorn)	224	323
Langmaid and Bettison (Black Minorca)	188	321
A. Heaysman (Cuckoo Leghorn)	184	322

Class 3.—*Black Orpingtons.*

Singles—		
K. Pennack	233	340
H. J. Mills	213	335
A. P. Urlwin	207	466
Trios—		
H. J. Mills	556	331-333
A. G. Dawes	505	328-330
A. P. Urlwin	486	465-467
Teams—		
H. J. Mills (only five birds)	947	331-336
K. Pennack	876	337-342
A. G. Dawes	837	452-457

Class 4.—*Any other Heavy Breed.*

Singles—		
H. J. Mills (Rhode Island Red)	218	364
F. F. Welford (Rhode Island Red)	193	374
K. Pennack (Barnvelder)	190	389
Trios—		
K. Pennack (Barnvelder)	538	388-390
K. Pennack (Barnvelder)	461	385-387
A. G. Dawes (Rhode Island Red)	451	370-372
Teams—		
K. Pennack (Barnvelder)	999	385-390
A. G. Dawes (Rhode Island Red)	782	367-372
F. F. Welford (Rhode Island Red) (only five birds)	777	373-378

SECTION 2.—DRY MASH.

Class 5.—*White Leghorns.*

	Eggs Laid.	Bird Nos.
Singles—		
A. J. Monkhouse	208	398
A. J. Monkhouse	196	401

IMPORTANT DAYS

IN

South Australia's

Centenary Calendar

SEPT. 5 to SEPT. 12.

ROYAL SHOW

7 Days and 7 Nights.

ENTRIES CLOSE–

FRIDAY, JULY 3.

S.A. Industries and Manufactures, including Apiculture, Needlework, Knitting, Cooking, Artcrafts, etc. Dairy Produce.

THURSDAY, JULY 30.

Cattle, Sheep, Wool, Fat Stock, Horses (Heavy, Roadster, Blood), Swine Judging Competitions, Sheaf Tossing.

TUESDAY, AUGUST 4.

Poultry, Pigeons, Dogs, Eggs.

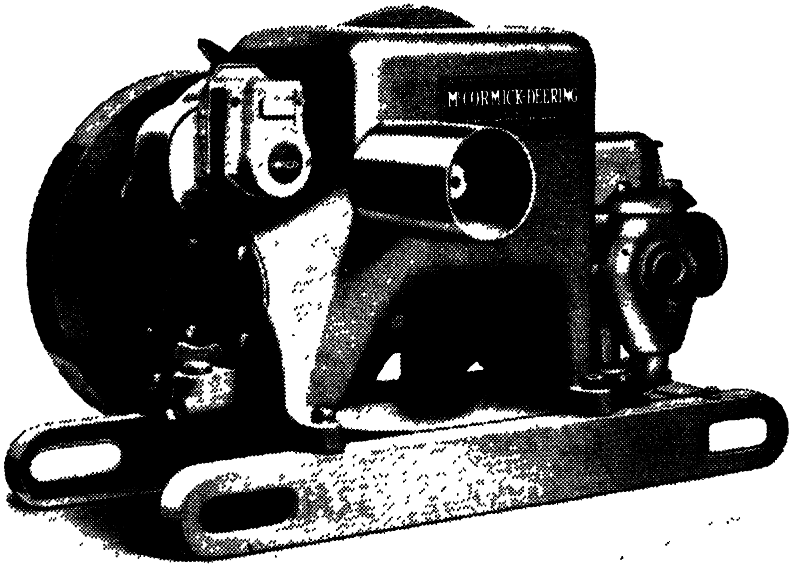
THURSDAY, AUGUST 6.

Horses-in-Action, Trotting.

Prize-Lists and Entry Forms are obtainable from the offices of the Royal Agricultural and Horticultural Society, Eagle Chambers, Pirie Street, Adelaide.

HAROLD J. FINNIS, Secretary.

Something NEW . . .
Worth seeing . . . Worth having



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Class 5.—*White Leghorns*—continued.

Trios—	Eggs Laid.	Bird Nos.
A. J. Monkhouse	520	400-402
G. R. Cowell	447	403-405
Teams—		
A. J. Monkhouse	953	397-402
G. R. Cowell (only five birds)	744	403-408

Class 7.—*Black Orpingtons.*

Singles—		
W. R. Christie	157	409

Class 8.—*Any other Heavy Breed.*

W. R. Christie (Rhode Island Red)	169	412

SECTION 3.—WET MASH.

Eric Pratt, Abattoirs (White Leghorn)	240	434
Peter Western, Ascot Park (White Leghorn)	234	415
Warren Hannaford, Paracombe (White Leghorn)	226	422
Peter Western, Ascot Park (White Leghorn)	225	416
Gordon Gallasch, Gilles Plains (White Leghorn)	224	437
Stanley Pratt, Abattoirs (White Leghorn)	213	435

The Red Comb Cup, donated by the Red Comb Egg Association, Incorporated, to the bird laying the highest number of first-grade eggs owned by a member of the Association, was won by Mr. A. J. Monkhouse, of Woodside. It is indeed very pleasing to see this breeder winner of the Cup. Mr. Monkhouse is one of the oldest commercial egg breeders in the industry, and a visit to his plant at Woodside is always a pleasure.

In the Home Project Section it is also interesting to note that Master Eric Pratt, of the Abattoirs School, who won this section in the 1934-35 competition, was again at the head of the section in the 1935-36 competition. The scores altogether in the Home Project Section were quite satisfactory; 13 birds from 38 entered gained a Standard Certificate.

STANDARD CERTIFICATES.

In the 1934-35 Competition the Department instituted a system of standard certificates. In order to qualify for these certificates a standard has been fixed as follows:—For light breeds 200 first-grade eggs, and for heavy breeds 180 first-grade eggs.

Of the 427 birds that completed the test 115 gained a Standard Certificate. This is equivalent to 27 per cent. of the birds that completed the test, and it is interesting to record that the percentage of the 1935-36 test is identical to that of the 1934-35 Competition.

GENERAL SUMMARY OF RESULTS.

Number of birds that completed the test	427
Average number of eggs laid	185.27

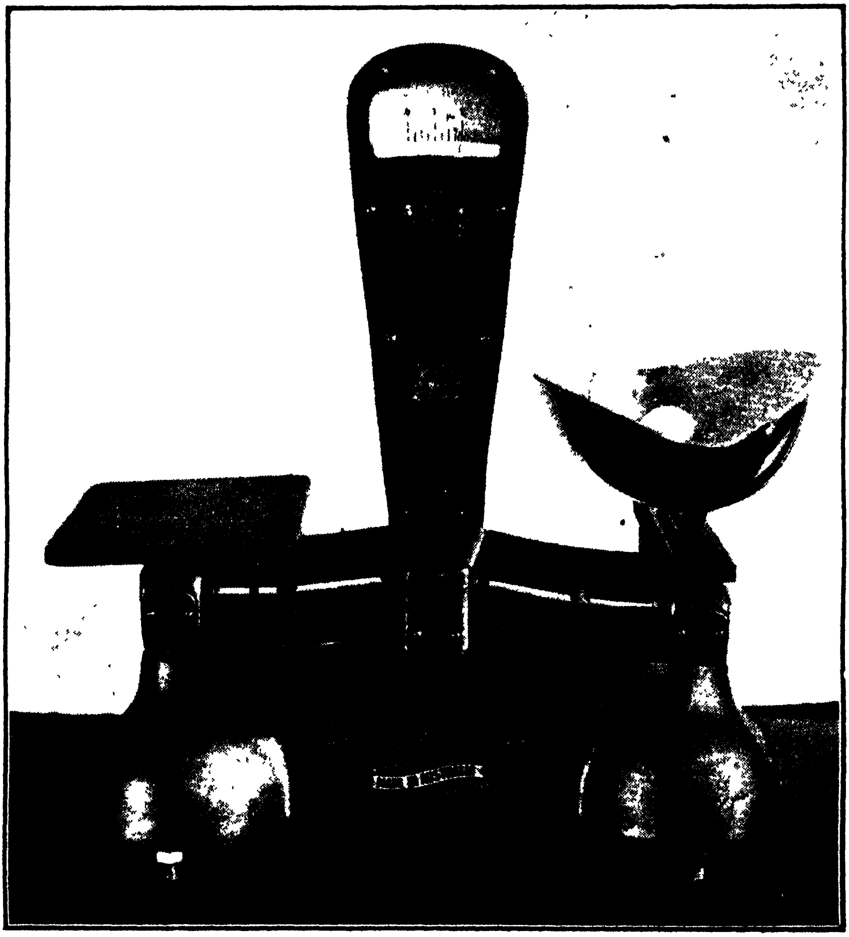
Averages of various breeds competing:—

Wet Mash Section—	Birds.	Eggs.
White Leghorns	286	192
Cuckoo Leghorns	3	186.66
Black Orpingtons	44	182.11
Home Project	36	176.52
Barnvelders	6	169.33
Minorcas	3	143.66
Rhode Island Reds	27	137.48
Dry Mash Section—		
White Leghorns	16	189.87
Rhode Island Reds	3	181
Black Orpingtons	3	177.66

Average cost of food per bird, 5s. 2d.
Average return per bird, 15s. 5d.
Return over cost of feeding, 10s. 3d.

TROPHIES.

The Red Comb Egg Association, Incorporated, was again instrumental in securing a very valuable set of trophies for winners of the various sections. Donations of these trophies are much appreciated by the Department, and are undoubtedly an incentive to the competitors, and it is a long time since such a fine assortment of trophies have been seen at the annual presentation as those presented by Hon. R. D. Nicholls, M.P. (Speaker of the House of Assembly), at a social evening held on Thursday, the 28th May.



In the Parafield Egg Laying Competitions each egg is carefully weighed to the fraction of one-eighth of an ounce, and the weight recorded on a special form.

The following firms donated trophies:—Messrs. Betteridge & Hall (egg-cleaning machine); South Australian Farmers' Co-operative Union (various trophies); B. J. Walters, Ltd. (clock); Parke Davis & Co., Ltd. (cup); Clarke, King & Co., Pty., Ltd. (Eggoleen cup); L. E. Saunders (watering system); Lanyon & Sons (watering system).

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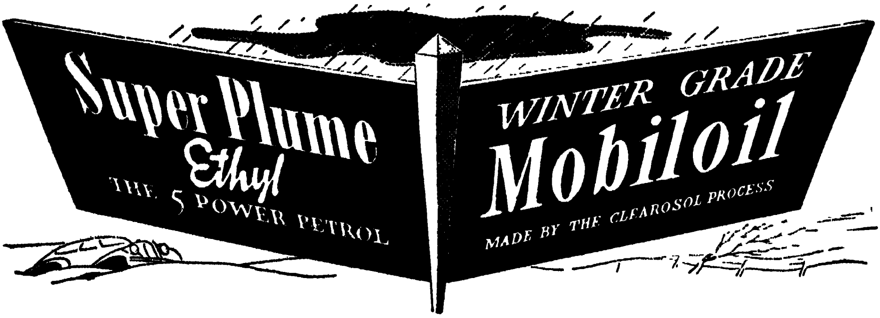

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Journal of Agriculture, January and July, 1921.

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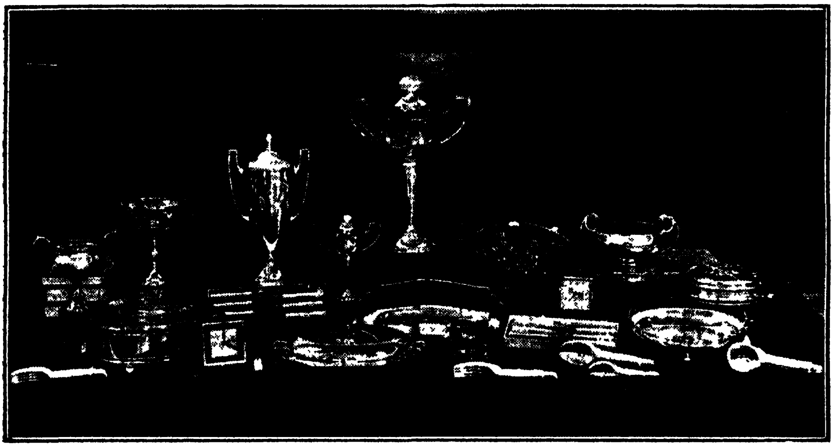
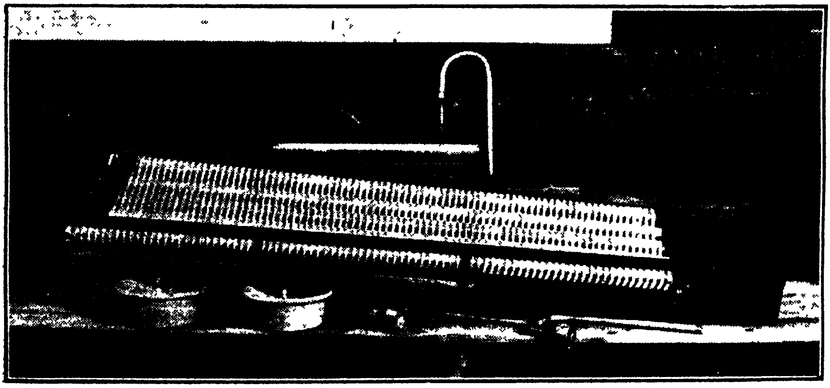


A Display of Trophies presented to Winners of the Parafield Egg Laying Competitions, 1935-36.



An Egg Cleaning Machine and Automatic Watering Devices, presented as trophies in the Parafield Egg Laying Competition, 1935-36.

SINGLE TEST EGG-LAYING COMPETITION, 1935-36,

PARAFIELD POULTRY STATION.

SECTION 1.—WET MASH.

Class 1.—*White Leghorns.*

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total	Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
B. Cooke, Kanmantoo	1	109	86	195	**R. W. McAlister, Yundi**	67	117	32	149
	2	146	44	190		68	182	25	207
	3	—	—	—		69	177	72	249
	4	186	3	189		70	162	17	179
	5	232	5	237		71	107	37	144
	6	209	44	253		72	205	2	207
	7	—	—	—	**T. Duhring, Mallala**	73	233	4	237
	8	—	—	—		74	*	*	*
	9	—	—	—		75	169	19	188
	10	—	—	—		76	99	136	235
	11	—	—	—		77	100	169	269
	12	—	—	—		78	132	112	244
A. H. Matthews, Bridgewater	13	209	30	239	**R. J. Underdown, Meadows**	79	66	207	273
	14	—	8	8		80	127	42	169
	15	196	73	269		81	195	9	204
	16	221	—	221		82	168	35	203
	17	188	24	212		83	143	102	245
	18	89	25	114		84	216	11	227
H. F. Muirson, Yundi.	19	*	*	*	**S. Hill, Bridgewater**	85	176	—	176
	20	179	15	194		86	222	4	226
	21	90	2	92		87	169	63	232
	22	163	1	164		88	225	1	226
	23	216	6	222		89	227	5	232
	24	58	5	63		90	193	—	193
E. McKee, 5, Rose Street, Carrondown	25	190	—	190	**W. R. Hedger, Yundi**	91	138	17	155
	26	*	*	*		92	177	—	177
	27	234	7	241		93	202	—	202
	28	231	24	255		94	176	15	191
	29	209	5	214		95	146	1	147
	30	225	6	231		96	194	1	195
H. C. Stacy, Meadows	31	93	54	147	**Langmaid & Bettison, Salisbury**	97	177	2	179
	32	122	138	260		98	65	28	93
	33	188	79	267		99	118	32	150
	34	92	153	245		100	196	8	204
	35	197	6	203		101	79	23	102
	36	247	12	259		102	7	107	114
T. Cleaver, Bridgewater	37	140	40	180	**E. Portlock Meadows**	103	229	3	232
	38	177	2	179		104	205	1	206
	39	94	95	189		105	208	25	233
	40	196	7	203		106	174	5	179
	41	172	16	188		107	154	68	222
	42	189	8	197		108	191	27	218
C. Sandstrom, Yundi	43	202	—	202	**Murray Powell, Jupiter Creek**	109	218	12	230
	44	*	*	*		110	47	11	58
	45	*	*	*		111	218	3	221
	46	88	108	196		112	192	2	194
	47	122	—	122		113	202	27	229
	48	162	70	232		114	49	189	238
A. J. Monkhouse, Woodside	49	88	10	98	**G. W. Bignell, Meadows**	115	214	1	215
	50	179	62	241		116	178	20	198
	51	220	6	226		117	166	13	179
	52	243	15	258		118	104	102	206
	53	136	23	159		119	200	24	224
	54	223	13	236		120	199	21	220
J. F. Smith, Meadows	55	187	5	192	**W. M. Field, Yundi**	121	204	9	213
	56	150	49	199		122	37	194	231
	57	10	20	30		123	169	5	174
	58	171	1	172		124	132	52	184
	59	71	2	73		125	66	81	147
	60	204	48	252		126	164	1	165
A. Young, Bridgewater	61	199	16	215	**C. R. Wharton, Meadows**	127	203	1	204
	62	203	1	204		128	214	1	215
	63	181	—	181		129	234	4	238
	64	137	9	146		130	226	17	243
	65	229	10	239		131	204	4	208
	66	180	1	181		132	151	3	154

* Dead.

Egg-laying Competition—continued.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
H. H. Hefford, Murray Bridge	133	191	2	193
	134	204	6	210
	135	209	11	220
	136	99	127	226
	137	206	34	240
	138	126	95	221
F. W. Gage, Meadows	139	191	1	192
	140	5	103	108
	141	*	*	*
	142	187	31	218
	143	183	5	188
	144	134	77	211
W. H. L. Norman, Echunga	145	77	86	163
	146	64	—	64
	147	*	*	*
	148	233	1	234
	149	199	9	208
	150	128	33	161
B. R. Whittington, Yundi	151	157	82	239
	152	115	1	116
	153	190	2	192
	154	214	2	216
	155	169	53	222
	156	188	2	190
B. C. Sanders, Meadows	157	201	3	204
	158	216	1	217
	159	234	2	236
	160	206	1	207
	161	140	49	189
	162	*	*	*
H. H. Gallagher, Pooraka	163	90	—	90
	164	*	*	*
	165	201	—	201
	166	169	2	171
	167	106	2	108
	168	222	1	223
W. Sickert, Meadows	169	230	2	232
	170	144	69	213
	171	237	13	250
	172	181	36	217
	173	152	94	246
	174	157	11	168
W. Restall, Echunga	175	108	2	110
	176	1	61	62
	177	158	—	158
	178	198	8	206
	179	182	26	208
	180	125	39	164
A. G. Dawes, 230, Portrush Road, Glenunga	181	227	—	227
	182	169	—	169
	183	187	11	198
	184	161	1	162
	185	*	*	*
	186	213	15	228
G. W. Sykes, Yundi	187	192	20	212
	188	95	—	95
	189	132	15	147
	190	182	3	185
	191	176	1	177
	192	209	3	212
R. Bartley, Meadows	193	128	103	231
	194	233	6	239
	195	201	2	203
	196	146	1	147
	197	190	—	190
	198	195	—	195
A. & H. Gurr, Mindaroo Poultry Farm, Bradbury	199	123	43	166
	200	188	—	188
	201	108	150	258
	202	183	58	241
	203	96	69	165
	204	121	112	233
J. J. Devlin, Meadows	205	176	61	237
	206	204	—	204
	207	245	1	246
	208	197	6	203
	209	180	—	180
	210	235	12	247
D. J Foxwell, Echunga	211	*	*	*
	212	193	1	194
	213	47	58	105
	214	26	1	27
	215	206	1	207
	216	100	1	101
F. J. Buck, Meadows	217	*	*	*
	218	211	10	221
	219	210	67	277
	220	101	74	175
	221	65	43	208
	222	125	73	198
J. A. Grist, Yundi	223	73	—	73
	224	132	—	132
	225	173	—	173
	226	78	16	94
	227	*	*	*
	228	171	—	171
L. A. King, Meadows	229	184	10	194
	230	200	—	200
	231	*	*	*
	232	83	—	83
	233	*	*	*
	234	*	*	*
R. W. Sando, Echunga	235	142	62	204
	236	90	160	250
	237	96	21	117
	238	134	25	159
	239	127	105	232
	240	149	66	215
E. W. Young, Meadows	241	184	4	188
	242	139	—	189
	243	193	2	195
	244	191	1	192
	245	—	—	—
	246	98	—	98
A. Jarvis, Yundi	247	206	—	206
	248	119	80	199
	249	177	2	179
	250	209	5	214
	251	159	30	189
	252	246	—	246
	253	—	—	—
	254	—	—	—
	255	—	—	—
	256	—	—	—
	257	—	—	—
	258	—	—	—
S. Bridge, Yundi	259	215	3	218
	260	227	—	227
	261	193	4	197
	262	134	68	202
	263	170	21	191
	264	172	41	213
H. G. Egarr, Meadows	265	180	73	253
	266	97	158	255
	267	*	*	*
	268	24	229	253
	269	141	60	201
	270	*	*	*
R. H. Smith, Yundi	271	211	18	229
	272	189	4	193
	273	217	—	217
	274	221	4	225
	275	52	116	168
	276	214	5	219

* Dead.

Egg-laying Competition—continued.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
J. M. Lawson, Meadows	277	218	—	218
	278	221	1	222
	279	167	23	190
	280	145	120	265
	281	194	50	244
	282	83	181	264
J. O. Marshall, Yundi	283	35	48	83
	284	206	6	212
	285	212	6	218
	286	174	40	214
	287	204	2	206
	288	82	2	84
G. Joyce, Meadows	289	*	*	*
	290	239	26	265
	291	95	157	252
	292	109	114	223
	293	226	2	228
	294	179	3	182
J. A. Bradtke, Yongala	295	14	88	102
	296	*	*	*
	297	196	1	197
W. H. A. Hodgson, Salisbury	298	169	1	170
	299	215	3	218
	300	216	—	216
A. W. McDonald, Gawler	301	67	150	217
	302	181	24	205
	303	200	3	203
J. H. Dowling, Glossop	304	162	—	162
	305	148	—	148
	306	22	—	22
A. P. Urlwin, Balaklava	307	152	1	153
	308	145	34	179
	309	25	1	26
L. S. Ekers, Mount Compass	310	188	17	205
	311	69	22	91
	312	191	33	224
V. E. Williams, Semaphore Park	313	229	—	229
	314	227	—	227
	315	233	—	233
F. P. Munzberg, Tanunda	316	223	3	226
	317	179	3	182
	318	224	4	228

Class 2—Any other Light Breed.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
Langmaid & Bettison, Salisbury. (Black Minorcas)	319	122	22	144
	320	82	4	86
	321	188	13	201
A. Heaysman, Government Road, Eden Hills (Cuckoo Leghorns)	322	184	1	185
	323	224	—	224
	324	148	3	151

Class 3—Black Orpingtons.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
A. G. Dawes, 230, Portrush Road, Glenunga	325	58	137	195
	326	31	83	114
	327	174	32	206
	328	164	88	252
	329	147	74	221
	330	194	2	196
H. J. Mills, 108, Edward Street, Edwardstown	331	202	—	202
	332	176	—	176
	333	178	—	178
	334	178	1	179
	335	213	2	215
	336	*	*	*

Class No. 3.—Black Orpingtons—continued.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
K. Pennack, Pooraka	337	173	14	187
	338	147	42	189
	339	85	14	99
	340	233	2	235
	341	77	182	259
	342	161	—	161
H. H. Gallagher, Pooraka	343	160	20	180
	344	152	5	157
	345	165	66	231
	346	157	1	158
	347	143	25	168
	348	50	17	67
B. Cooke, Kanmantoo	349	47	147	194
	350	84	136	220
	351	55	157	212
H. H. Hefford, Murray Bridge	352	157	2	159
	353	123	21	144
	354	84	103	187
J. H. Dowling, Glossop	355	153	22	175
	356	60	122	182
	357	163	8	171
L. S. Ekers, Mount Compass	358	170	9	179
	359	107	1	108
	360	176	6	182
A. G. Dawes, 230, Portrush Road, Glenunga	452	111	55	166
	453	124	7	131
	454	147	78	225
	455	78	1	79
	456	185	11	196
	457	192	39	231
A. P. Urlwin, Balaklava	465	140	85	225
	466	207	4	211
	467	139	72	211

Class No. 4.—Any other Heavy Breed.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
H. J. Mills, 108, Edward Street, Edwardstown (Rhode Island Reds)	361	3	—	3
	362	*	*	*
	363	91	1	92
	364	218	59	277
	365	99	27	126
	366	*	*	*
A. G. Dawes, 230, Portrush Road, Glenunga (Rhode Island Reds)	367	96	54	150
	368	146	2	148
	369	89	20	109
	370	182	1	183
	371	102	1	103
	372	167	3	170
F. F. Welford, 1, Ludgate Circus, Colonel Light Gardens (Rhode Island Reds)	373	174	—	174
	374	193	—	193
	375	*	*	*
	376	75	4	79
	377	174	5	179
	378	161	1	162
V. F. Gameau, Findon Road, Woodville (Rhode Island Reds)	379	72	86	158
	380	175	47	222
	381	155	4	159
	382	119	2	121
	383	25	41	66
	384	79	13	92
K. Pennack, Pooraka (Barnevelders)	385	189	1	190
	386	122	1	123
	387	150	—	150
	388	183	4	187
	389	190	11	201
	390	165	—	165

* Dead.

Egg-laying Competition—continued.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
Class No. 4.—Any other Heavy Breed—contd.				
A. G. Dawes, 230, Portrush Road, Glenunga (Rhode Island Reds)	458	19	2	21
	459	116	13	129
	460	152	43	195
	461	15	—	15
	462	177	3	180
	463	146	60	206

SECTION 2—DRY MASH.

Class No. 5—White Leghorns.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
G. R. Cowell, Balhannah	391	195	12	207
	392	111	85	196
	393	*	*	*
	394	106	66	172
	395	75	131	206
	396	138	41	179
A. J. Monkhouse, Woodside	397	43	31	74
	398	208	13	221
	399	182	8	190
	400	133	77	210
	401	196	26	222
	402	191	61	252
G. R. Cowell, Balhannah	403	179	45	224
	404	188	13	201
	405	80	6	86
	406	185	30	215
	407	112	71	183
	408	*	*	*

Class No. 7—Black Orpingtons.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
W. R. Christie, Upper Mitcham	409	157	76	233
	410	141	13	154
	411	133	13	146

[Class No. 8 - Any other Heavy Breed.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
W. R. Christie, Upper Mitcham (Rhode Island Reds)	412	169	2	171
	413	77	78	155
	414	144	73	217

SECTION 3—WET MASH.

Home Project Utility Section—Any breed.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
Peter Western, Ascot Park School (White Leghorn)	415	234	1	235
Peter Western, Ascot Park School (White Leghorn)	416	225	17	242
William Sando, Echunga School (White Leghorn)	417	205	–	205
Douglas Marshall, Yundi School (White Leghorn)	418	204	1	205
Norman Page, Murray Bridge School (White Leghorn)	419	203	—	203
Kelvyn & Brian Nicholls, Finniss School (White Leghorn)	420	132	2	134
Dean Colwell, Grange School (White Leghorn)	421	160	—	160
Warren Hannaford, Paracombe School (White Leghorn)	422	226	—	226
W. Horne, Woodville School (White Leghorn)	423	*	*	*

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
Home Project Utility Section—Any Breed—contd.				
Owen Robinson, Ascot Park School (White Leghorn)	424	173	38	211
June Chapman, Woodchester School (White Leghorn)	425	191	2	193
Rosa Hunt, Morphett Vale School (White Leghorn)	426	111	115	226
Jack O'Sullivan, Morphett Vale School (White Leghorn)	427	133	112	245
Peter Taylor, Morphett Vale School (White Leghorn)	428	80	14	94
James Taylor, Morphett Vale School (White Leghorn)	429	211	3	214
William Gregory, Victor Harbour School (White Leghorn)	430	179	1	180
Ian Bruce, McLaren Flat School (White Leghorn)	431	161	—	161
Clifford Burford, Smithfield School (White Leghorn)	432	134	9	143
Tom Callaghan, Smithfield School (White Leghorn)	433	61	—	61
Eric Pratt, Abattoirs School (White Leghorn)	434	240	2	242
Stanley Pratt, Abattoirs School (White Leghorn)	435	213	5	218
Alan Yelland, Cunliffe School (Minorca)	436	115	1	116
Gordon Gallasch, Gilles Plains School (White Leghorn)	437	224	2	226
Clarence King, Tarlee School (White Leghorn)	438	95	12	107
Olive Pitman, Gilles Plains School (Black Orpington)	439	128	—	128
Donald Heading, Sturt School (Black Orpington)	440	175	3	178
Clive Steer, Sturt School (Black Orpington)	441	177	10	187
Herbert Oliver, McLaren Vale School (Black Orpington)	442	204	18	222
Lyol Stone, Morphett Vale School (Black Orpington)	443	*	*	*
Ray Candy, Noarlunga School (Black Orpington)	444	83	2	85

*Dead.

Egg-laying Competition—continued.

Competitor.	Bird No.	1st Grade.	2nd Grade.	Total.
Home Project Utility Section—Any Breed—contd.				
Malcolm Booth, Bridgewater School (Black Orpington)	445	189	15	204
Murray Heneker & Frank Short, Hamley Bridge School (Black Orpington)	446	176	—	176
Peter Boucaut, Seaton Park School (Rhode Island Red)	447	53	69	122
Peter Preece, Gilles Plains School (Rhode Island Red)	448	72	3	75
Cliff Crosser, Wellington Road School (White Leghorn)	449	151	93	244
John Keldoulis, Orroroo School (Black Orpington)	450	192	—	192
Bruce Dooland, Thebarton School (Black Orpington)	451	171	—	171
Alan Yelland, Cunliffe School (Rhode Island Red)	464	123	1	124

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

STRATHALBYN CONFERENCE.

Branches of the Agricultural Bureau situated in the dairying districts met in Conference at Strathalbyn on Thursday, 21st May. Mr. C. M. Hudd presided, and the Department of Agriculture was represented by Messrs. P. J. Baily, A. J. Cooke, Professor A. J. Perkins (Advisory Board of Agriculture), W. J. Spafford (Director of Agriculture), H. B. Barlow, H. J. Apps, P. H. Suter, and H. C. Pritchard (General Secretary). The opening address was delivered by Mr. P. J. Baily.

"The Dehorning of Dairy Cattle" was the subject of a paper presented by Mr. J. Y. Hudd (Adelaide). Mr. C. Lund (Strathalbyn) contributed a paper entitled "Producing only Choice Grade," and Mr. J. R. Hewland (Adelaide) "The Milk Equalisation Plan."

Several questions of interest were answered by the officers present, and the following resolutions were carried:—(1) "That all resolutions and questions at future Dairy Conferences be taken immediately upon resuming after the luncheon adjournment." (2) "That this Conference suggests to the Department of Agriculture that five delegates be appointed from cream suppliers of the Dairymen's Association and five representatives from manufacturers, with an independent chairman, to confer for the purpose of arriving at means to eliminate the overlapping of transport of cream supplies." (3) "That this Conference suggests that the 10lbs. exemption in the Dairy Industry Act be cut out altogether, and that the Act be amended accordingly." (4) "As South Australia has the lowest agricultural Vote of all the States, that the Government be asked to increase the Vote." (5) "That legislation be enacted on lines similar to the Fertilizer Act to protect consumers against contaminated or adulterated bran and pollard." (6) "That the next Conference of Dairying Districts be held at Lobethal." (7) "That a stamp duty be organised to compensate producers for losses due to condemnation of all dairy cattle and pigs."

SOIL EROSION IN THE DRIER AUSTRALIAN INTERIOR.

The Council for Scientific and Industrial Research is now distributing copies of a report (Pamphlet 64) discussing soil drift and erosion in the arid interior and more particularly in the northern portions of South Australia.

It is pointed out that Australia might well learn a lesson from other countries, such as America, where soil erosion has lately developed into a most serious problem. In America, for instance, it appears that half the total area devoted to agricultural and pastoral pursuits has been adversely affected, and a large proportion of this area irreparably destroyed. In Australia, the trouble has not reached such proportions, but nevertheless it is quite evident that the time is fully ripe for something to be done to prevent any further damage.

Erosion of soils is caused by various agencies. An obvious type is the damage by gullying of paddocks, siltration of streams, &c., following deforestation of watersheds. Another type is caused by agricultural practices in the drier regions; trouble of that nature occurs in the Mallee. Yet another type is the erosion and creation of desert conditions in the drier pastoral areas, for example, those receiving not more than an average of 10in. of rain per annum in the arid interior of the Australian Continent. It is this last mentioned type of erosion that is discussed in the Council's pamphlet.

The report—which was written by Mr. F. N. Ratcliffe, B.A.—indicates that a large proportion of the area concerned has already been seriously eroded and much of the remainder is fast going the same way. It is mentioned, for instance, that some 90 per cent. of the saltbush area has been badly affected, but that a smaller percentage of the mulga areas is as yet seriously damaged. It seems that the trouble is due to the combined effects of overstocking, run of bad droughts, and the rabbit pest. Stock (and rabbits) for instance, kill off the vegetation and grasses (being particularly severe on seedlings) and then there is nothing left to bind the soil and to enable it to withstand disintegration and destruction by winds. In consequence over large areas the good soil is completely blown away, leaving a hard concrete-like subsoil on which no plant life can maintain itself. In other places the finer portions of the soil are blown away, leaving a sandy desert behind them.

Remedial measures are rendered most difficult by the fact that much of the area concerned is rarely worth as much as 2s. per acre in its virgin state. The main conclusion of the report is that a controlled and light stocking rate is the only hope of salvation, in other words, when the stocking is such as to be in equilibrium with the vegetation and not merely exploiting the plant capital. Nothing that the botanist may ultimately achieve can abolish the necessity of placing the stocking on a permanent and scientific basis. It is recommended that investigation along certain lines be initiated, including the search for extra sand-binding plants.

Some consideration is also given in the pamphlet to the effect of the rabbit in these arid areas. It is pointed out that the population of the pest fluctuates violently from year to year, increasing to plague numbers in the good years and diminishing to solitary individuals in the bad years. Despite the severity of the droughts, it seems improbable that the pest can ever be completly wiped out in these arid areas.

This latter statement, however, should not be construed, as has recently been done in some quarters, to mean that it is hopeless to expect to wipe out the rabbit in more favoured areas of Australia. In the first place, these areas have a greater capital value and can thus stand a greater cost of rabbit eradication. Further, they are much better placed for eradication, or at least the permanent reduction of rabbit population, by means of such agencies as wire netting, destruction of cover, dogging, and possibly disease. The Council is in fact enquiring into the possibilities of one disease, rabbit myxomatosis, which has been proved by Sir Charles Martin in Great Britain to be particularly effective against rabbits. Tests are now about to be made to ascertain whether it would be safe to spread the disease in Australia from the point of view of its possible effect on livestock and native animals.

INVESTIGATIONS INTO THE CONDITION KNOWN AS "FLOATING AND CLOUDY YOLK" IN EGGS.

[By C. F. ANDERSON (Government Poultry Expert) and A. E. PLATT, M.B., B.S., Dip. Bact. (London) (Deputy Director, Government Laboratory of Bacteriology and Pathology).]

During the past 12 months an abnormal condition has been found in eggs on the various egg floors. This condition is, for the purpose of this article, termed "Floating and Cloudy Yolk." It is quickly detected when the eggs are being candled, the first noticeable feature being the yolk appears a little darker in colour than that of the normal egg. The yolk is mobile, and floats to various positions in the egg. In some eggs it will go to the bottom, and in other cases it will go to the top. In a big percentage of these eggs the yolk gets gradually darker in colour according to the length of time the egg is kept.

Generally, the egg on being broken is, however, normal in colour. The white in most cases is normal, although in a few instances it is a little thin and watery. The yolk appears quite firm.

The number of eggs so affected was sufficient to warrant close investigation, and in this direction the Poultry Section of the Department of Agriculture of South Australia commenced detailed investigations. The work was started with the testing, each day, of all eggs laid in the Single Test competition conducted at the Government Poultry Station, Parafield, South Australia. This test comprised 427 birds, all in the first laying season, and the following breeds were represented:—White Leghorns, Cuckoo Leghorns, Black Minorcas, Black Orpingtons, Rhode Island Reds, and Barnevelders. Each bird was housed in a separate pen, and the birds were entered by breeders in various parts of the State. *The eggs were all tested immediately after collection and prior to being cleaned and packed for market purposes.*

A similar condition was reported by E. T. Halnan, M.A., and H. D. Day (1935). The incidence was very low, and it is doubtful whether the conditions were similar to those found in the Parafield investigations.

TESTING.

The work at Parafield was started in December, 1935, and the following table shows the results of the testing:—

Week Ending.	Total Eggs Tested	Tested as Floating and Cloudy Yolks	Per Cent. with Floating and Cloudy Yolks
Dec. 22nd, 1935	1,570	232	14.77
Dec. 29th, 1935	1,597	321	20.10
Jan. 5th, 1936 ..	1,727	461	26.69
Jan. 12th, 1936	1,709	531	31.07
Jan. 19th, 1936 . .	1,687	571	33.84
Jan. 26th, 1936 .	1,582	618	39.06
Feb. 2nd, 1936 . .	1,658	738	44.51
Feb. 9th, 1936	1,635	979	59.87
Feb. 16th, 1936	1,548	960	62.01
Feb. 23rd, 1936	1,451	963	66.36
March 1st, 1936	1,420	1,019	71.76
March 8th, 1936	1,393	1,092	78.39
March 15th, 1936 . ..	1,380	1,245	90.21
March 22nd, 1936 . ..	1,277	1,169	91.54
March 29th, 1936 . ..	1,147	1,078	93.98

Continuing the work of testing, it was decided to test the eggs of several private breeders. With that object in view, an officer of the Department visited breeders in several parts of the State, and the results of the testing on five of the largest farms are given. On all the farms, where eggs were tested, the results were practically the same as those obtained at Parafield. For record purposes, the farms are referred to as A, B, C, D, E. Farms A and B are situated in the Angaston district, C and D at Moonta Mines and North Yelta, and E at Murray Bridge. The result of the testing was:—

FARM A.—*Results of Testing.*

Week Ending.	Total Eggs Tested.	Tested as Floating and Cloudy Yolks.	Per Cent. with Floating and Cloudy Yolks.
12/2/36	250	233	93.2
19/2/36	250	242	96.8
26/2/36	250	244	97.6
4/3/36	250	248	99.2
11/3/36	250	250	100
18/3/36	250	238	95.2
25/3/36	200	200	100
1/4/36	250	250	100
8/4/36	250	250	100
15/4/36	250	250	100
22/4/36	250	250	100

The feeding adopted at Farm A was as follows:-

Morning: Wet mash composed of 2 parts pollard by measure, 1 part bran by measure, ½lb. meat meal per 100 birds, ¼lb. Meggitt's linseed meal per 100 birds, ¼lb. tobacco dust per 100 birds; 25 per cent. to 30 per cent. greenfeed to every 100lbs. mash in the morning. Mash was mixed with separator milk.

Midday and Night: Wheat.

The birds had free range for three or four hours each day. The age of the birds was from 18 months to 3 years.

FARM B.—*Results of Testing.*

Week Ending.	Total Eggs Tested.	Tested as Floating and Cloudy Yolks.	Per Cent. with Floating and Cloudy Yolks.
12/2/36	250	250	100
19/2/36	250	249	99.6
26/2/36	250	248	99.2
4/3/36	250	250	100
11/3/36	250	250	100
18/3/36	250	250	100
25/3/36	216	216	100
1/4/36	288	288	100
8/4/36	338	338	100
15/4/36	250	250	100
22/4/36	250	250	100

The feeding adopted at Farm B was as follows:—

Morning: Wet mash composed of:—Bran, 1 part by weight; pollard, 2½ parts by weight; meat meal, ½lb. per 100 birds; key meal, ½lb. per 100 birds; tobacco dust, ¼lb. per 100 birds; buttermilk powder, ¼lb. per 100 birds; chaffed lucerne, 30 per cent. The mash was mixed with separator milk.

Midday: Wheat.

Afternoon: Chaffed lucerne.

Night: Wheat.

The birds were allowed free range each afternoon. The age of the birds was 1, 2, and 3 years.

Farm C.—*Results of Testing.*

Period Ending.	Total Eggs Tested.	Tested as Floating and Cloudy Yolks.	Per Cent. with Floating and Cloudy Yolks.
12/2/36	100	81	81
17/2/36	241	219	90.8
19/2/36	350	336	96.8
26/2/36	350	331	94.5
4/3/36	300	269	89.6
11/3/36	300	291	97
18/3/36	300	287	95.6
25/3/36	200	199	99.5
1/4/36	350	334	95.4
6/4/36	350	347	99.1
15/4/36	350	350	100
22/4/36	360	357	99.1

The feeding adopted at Farm C was as follows:—

Morning: Wet mash composed of:—Bran, 1 part by measure; pollard, 3 parts by measure; whole grain (wheat), 9 per cent.; meat meal, 3 per cent.; linseed meal, 3 per cent.; greenfeed (lucerne), 18 per cent. Morning mash mixed with hot water containing 4ozs. of fine salt.

Midday: Wet mash composed of:—Bran, 25 per cent.; pollard, 30 per cent.; wheat, 10 per cent.; greenfeed, 35 per cent. Midday mash mixed with cold water.

Evening: Wheat.

Farm D.—*Results of Testing.*

Period Ending.	Total Eggs Tested.	Tested as Floating and Cloudy Yolks.	Per Cent. with Floating and Cloudy Yolks.
12/2/36	300	286	95.3
26/2/36	288	267	92.7
6/3/36	216	207	95.8
25/3/36	180	179	99.4
1/4/36	360	358	99.4
6/4/36	360	360	100
15/4/36	360	360	100
22/4/36	350	350	100

The method of feeding adopted at Farm D was as follows:—

Morning: Wet mash composed of:—Bran, 1 part by weight; pollard, 2 parts by weight; chaffed lucerne, 20 per cent.; meat meal, ¾lb. per 100 birds; linseed meal, ¼lb. per 100 birds; charcoal grit, ¼lb. per 100 birds. Mixed with separator milk.

Midday: Grain (equal parts wheat and barley).

Night: Grain (three parts wheat, 1 part barley).

Farm E.—*Results of Testing.*

Period Ending.	Total Eggs Tested.	Tested as Floating and Cloudy Yolks.	Per Cent. with Floating and Cloudy Yolks.
10/2/36	237	235	99.1
14/2/36	221	213	96.3
21/2/36	146	146	100
2/3/36	200	200	100
11/3/36	250	250	100
16/3/36	214	209	97.6
30/3/36	220	220	100
8/4/36	300	300	100
14/4/36	250	250	100
20/4/36	250	250	100

The method of feeding adopted at Farm E was as follows:—

Morning: Wet mash composed of:—Bran, 1 part by weight; pollard, 3 parts by weight; meat meal, 8 per cent.; key meal, 11 per cent.; charcoal, 5 per cent.; pestend, 2 per cent.

Afternoon: Wheat at rate of 1¾ozs. per bird.

Night: Chopped greenfeed at rate of 7lbs. per 100 birds.

No greenfeed was fed in the morning mash. The birds were housed on the semi-intensive method in units of 30 birds.

The above figures indicate the extent of this particular trouble, and show that it is widespread. There is one particularly noticeable feature, and that is the large number of eggs which test apparently normal immediately after laying and develop the condition within three or four days.

HEALTH OF STOCK.

From general observation of the stock, there does not appear anything wrong with them. They appear to be in normal health; the laying apparently is not affected, as production has been maintained at a reasonable level.

EFFECT ON HATCHING.

With a view to testing the effect, if any, on hatching of eggs showing, on candling, the condition of floating and cloudy yolks, three lots each of 100 eggs were incubated with the following results:—

	No. Eggs Set.	No. Chicks Hatched.
Batch No. 1	100	81
Batch No. 2	100	77
Batch No. 3	100	69

From the above results it will be seen that the eggs hatched well. The chickens were particularly strong and active, and are being kept for research purposes.

FEEDING.

In the early stages of the trouble, it was thought that probably feeding may have an important bearing on the subject, and all wheat fed at Parafield Poultry Station for a period was sterilised. A portion of the sterilised wheat was crushed and fed together with greenfeed and meat meal, the balance of the wheat fed as whole grain. No noticeable difference was, however, found in the condition of the eggs on being candled.

EFFECT ON THE KEEPING QUALITIES OF THE EGGS.

A considerable amount of work was carried out in this direction, and is being continued. Hundreds of dozens of the eggs in this condition have been placed in cool storage, and have been tested almost every week. In the majority of instances, the only noticeable difference on candling is that the yolks in a small percentage of cases go a little dark in colour, but in almost every instance the eggs when broken on a plate appear quite normal in colour of yolk and white, and do not carry any trace of taint.

For the past four years the Department of Agriculture has carried out investigations into the question known as "Watery White" in eggs. A progressive report has been published on this subject in Bulletin No. 308 issued by the Department (1936). The condition, however, referred to in this article as "floating and cloudy yolks" appears to be, from candling, an entirely different one from that of "watery white."

EXPERIMENTAL WORK.

As a preliminary investigation a chemical estimation of the protein content of the white of these eggs was made. The estimations were made (by Mr. R. J. Cowan, of the Government Laboratory of Bacteriology and Pathology) on adequate samples taken from the pooled whites of three dozen "floating yolk" eggs, and the results compared with those obtained in similar estimations on the pooled whites of three dozen eggs passed for export. The results of these estimations were as follows:—

	Protein Content of Egg-white. Per Cent.
(i.) Eggs passed for export	10.6
(ii.) Eggs rejected (floating yolk)	11.0

Non-protein nitrogen estimations were identical for both batches, being approximately 25 milligrams per 100 c.c. egg-white.

These results indicate that there is no difference in protein content of the whites of the eggs and, in this respect, the condition differs from that known as "watery white."

CHANGES NOTED IN EGGS WITH "FLOATING YOLKS."

Besides the excessive degree of mobility of the yolk which is diagnostic of this condition, two other phenomena can be observed in a large percentage of these eggs. Frequently, especially when the eggs have been kept in cold storage for some time, the shadow of the yolk appears much darker than that usually produced by the yolk in this condition. The most interesting observation in connection with the candling of these eggs was that in many cases the shadow of what appeared to be an appendage to the yolk was clearly visible.

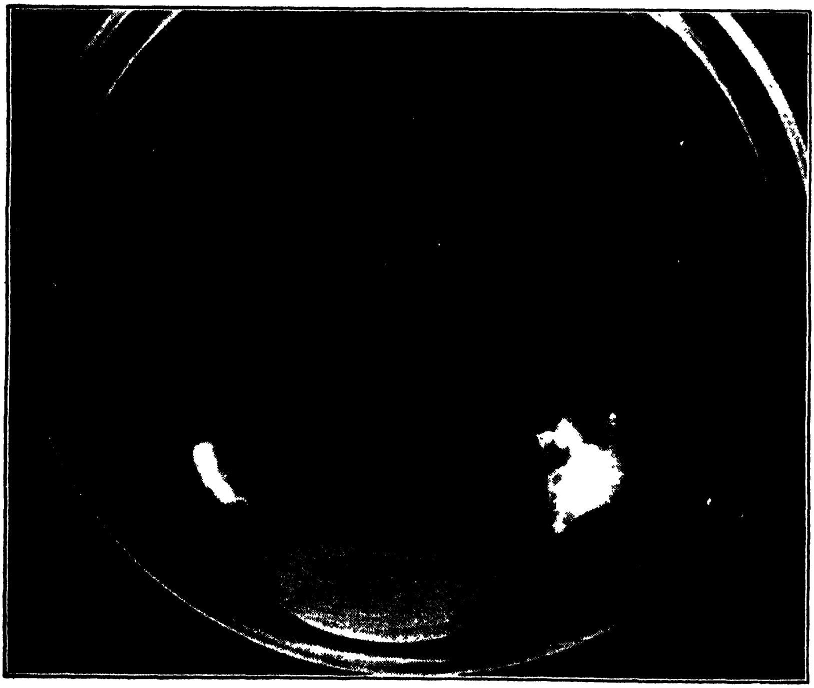


FIG. 1.—Showing thickened ligaments and the slight opacity which surrounds the yolk.

When such eggs were broken, often little change was apparent. In many instances the yolks appeared normal in colour. In others there was a definite darkening of the yolk which, in many cases, was associated with a partial coagulation of the proteins giving the yolk an appearance of candied honey or lemon-cheese. In a few cases, besides this partial coagulation of the main mass of the yolk, small plaques of dried, or inspissated yolk were found adherent to the vitelline membrane.

In many eggs the white appeared normal, but in a large percentage there was a zone of semi-opaque white surrounding the yolk (Fig. 1). This zone was most frequently seen in eggs which, upon candling, showed a darker yolk than usual.

The most striking change, however, and one which was present in all affected eggs, was noticed in connection with the chalaza or suspensory ligament of the yolk. One, or sometimes both, showed considerable enlargement with marked increase in opacity of the egg-white immediately surrounding it (Figs. 1 and 2). The end nearest the shell was always ragged in appearance, and showed signs of partial digestion.

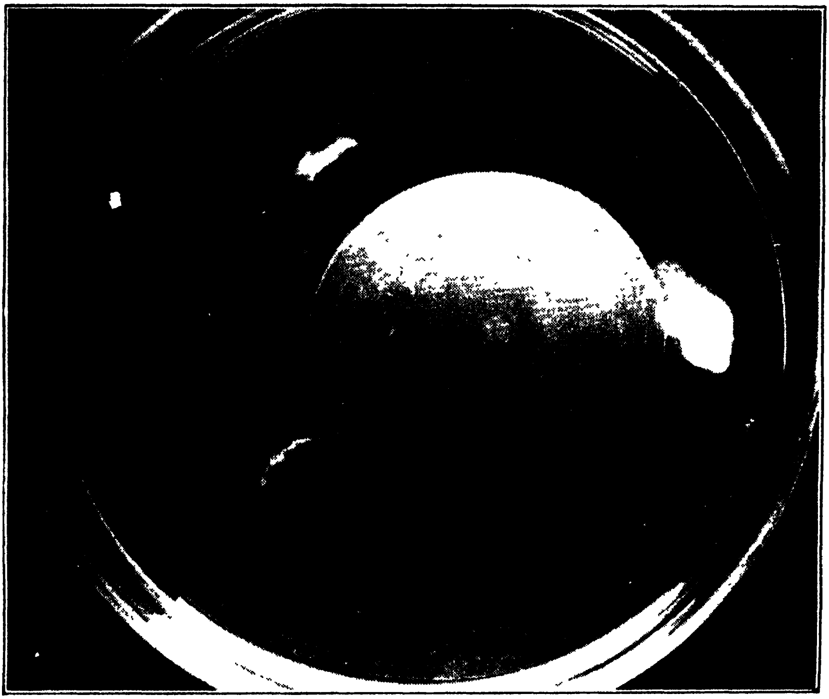


FIG 2—Showing one thickened ligament Compare with normal ligament at opposite pole of yolk.

From observations it seemed fairly clear that the thickened condition of the chalaza was related to the "floating yolk" condition, and on this assumption the investigations described below were made with the object of elucidating the nature of this pathological change in the chalaza.

Paraffin sections of the chalaza were prepared and stained with haemotoxylin and eosin. In suitably cut sections, where the suspensory ligament was cut transversely across, masses of rod-shaped organisms could be seen in the interior of the chalaza (Fig. 3). By suitable means this organism was recovered in pure culture (*see* Platt, 1936). It was a Gram-positive rod-shaped motile organism which under adverse conditions formed oval subterminal spores.

The appearance of this organism on culture media was very characteristic (see Platt, 1936), and although it was impossible to name this organism it could at least be placed in the Genus *Bacillus*.

An interesting observation concerning the spores of this organism is that they can withstand boiling in water for five minutes.

Attempts were now made to reproduce the "floating yolk" condition in eggs of hens in which up till the time of carrying out the experiments no abnormality had been detected. Owing to the difficulty of obtaining birds laying normal eggs, only 12 birds were available for these experiments. These birds were divided into three groups, two of which were kept at the Government Poultry Farm at Parafield, and the other group brought to the Government Laboratory of Bacteriology and Pathology.

During the experiments the hens were fed on wheat sterilized by autoclaving, crushed grain prepared from autoclaved wheat, and lucerne locally grown. Drinking water was obtained from the main supply or from tanks. Spores of the bacillus were added to the drinking water, and also each bird received, each day, a pellet of sterilised wholemeal to which spores had been added, for five consecutive days. During the whole period of observation the birds remained perfectly healthy, but in periods ranging from two days to a fortnight all the birds commenced laying "floating yolk" eggs. In birds laying regularly every day, the second or third egg laid after the commencement of the experiment showed the "floating yolk" condition. In two or three birds no egg was laid for more than a week, and in these cases the first eggs laid after commencement of the experiment possessed "floating yolks." A number of these "floating yolk" eggs laid during the experiments were examined bacteriologically, and the characteristic bacillus recovered from the thickened chalaza.

FIG. 3.—Showing masses of organisms in cavity of suspensory ligament.

Throughout all these observations the healthy condition of the hens was striking. In order to see whether any lesions were present, four hens laying "floating yolk" eggs were killed and examined *post-mortem*. No abormality of any kind could be detected. Cultures were made from the oviducts of three of the birds. In two cases they were negative, but in the remaining one a pure culture of the bacillus was obtained from the upper portion of the oviduct.

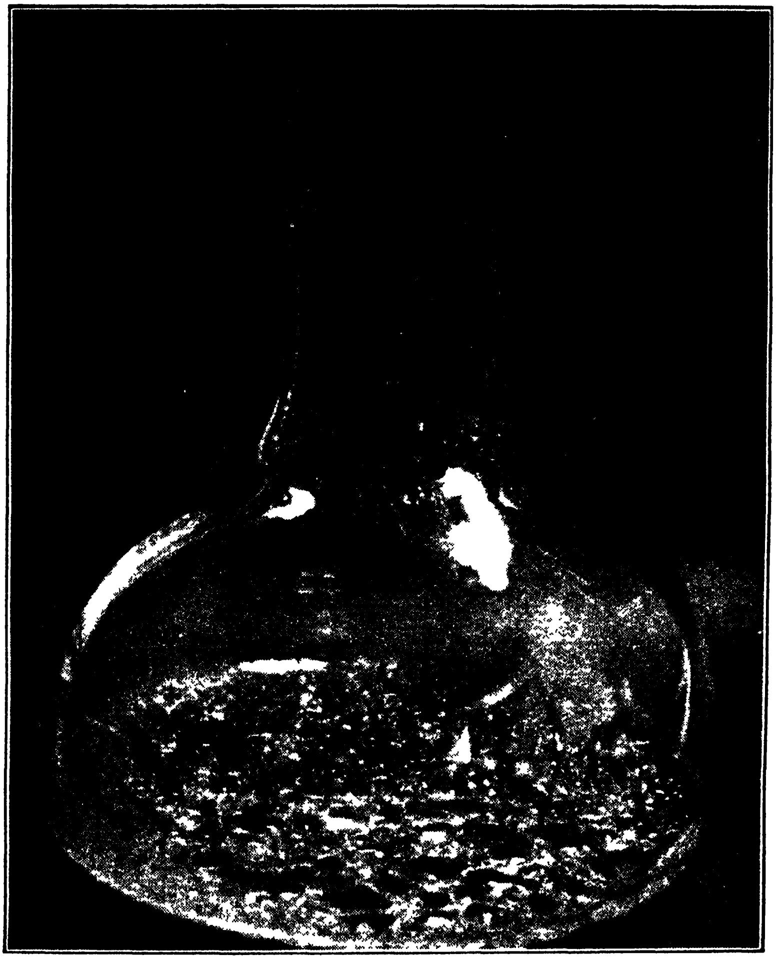


FIG. 4.—Broth culture (24 hours) of organism isolated from suspensory ligament, showing pellicle formation

DISCUSSION.

The widespread distribution of this condition and the rapid increase in its incidence in various localities are rather puzzling, and as yet it is not possible to offer any explanation. The relationship of the bacillus recovered from the chalaza of affected eggs to the "floating yolk" condition is also not quite clear. Whether it is the sole and primary cause or whether its role is only that of a secondary invader, following some biological disturbance or other bacterial infection, has still to be determined. With this proviso we might postulate an hypothesis as to the means by which this bacillus gains admission to the eggs and the part it plays in producing the "floating yolk" condition.

The organism is probably taken into the alimentary tract in the spore form, and possibly germinates there, whence it passes *via* the cloaca to the oviduct. There it becomes incorporated in the chalaza before the white is added to the yolk. In the chalaza, in the course of its metabolism, it produces an enzyme capable of digesting protein, and this enzyme brings about a dissolution of portion of the chalaza which, rupturing, allows the yolk to float freely. Further investigations are being made to determine the correctness or otherwise of this hypothesis, and also to endeavour to discover a method of treatment. A few experiments using living and killed vaccines have been performed with disappointing results so far.

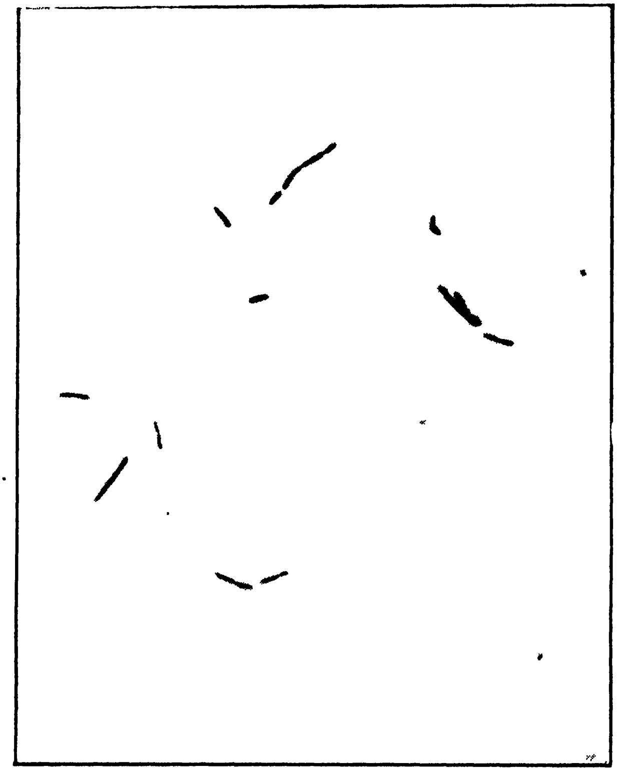


FIG. 5.—Film (gram stain) of organism isolated from suspensory ligament (X 1100)

SUMMARY.

1. A condition in eggs known as "floating yolk" is described, and the incidence and distribution are discussed.

2. A Gram-positive motile spore-forming organism can be recovered from a large percentage of affected eggs.

3. When birds, which were laying normal eggs, were fed with spores of this organism they commenced laying "floating yolk" eggs.

4. The role of this organism in connection with the "floating yolk" condition is discussed.

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OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1936-37.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

*Class No. 1.—White Leghorns—*351 *Birds Competing.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936	
A. G. Dawes, Portrush Road, Glenunga.	1	9	
	2	19	
	3	12	40
	4	9	
	5	25	
	6	34	68
			108
A. Young, Bridgewater.	7	21	
	8	30	
	9	32	83
	10	19	
	11	21	
	12	14	54
			137
H F Muirson, Yundi.	13	1	
	14	22	
	15	4	27
	16	32	
	17	9	
	18	32	73
			100
T. E. Hincks, Echunga.	19	16	
	20	12	
	21	24	52
	22	24	
	23	14	
	24	23	61
			113
John Turner, Meadows.	25	33	
	26	30	
	27	18	81
	28	19	
	29	32	
	30	32	83
			164
T. Duhring, Mallala.	31	32	
	32	34	
	33	28	94
	34	27	
	35	10	
	36	30	67
			161
A. G. Dawes, Portrush Road, Glenunga. (Class No. 4.—Rhode Island Reds.)	37	32	
	38	23	
	39	28	83
	40	5	
	41	18	
	42	11	34
			117
J. O. Marshall, Yundi.	43	27	
	44	6	
	45	21	54
	46	26	
	47	20	
	48	1	47
			101
F. A. Merrett, Echunga	49	25	
	50	3	
	51	12	40
	52	20	
	53	38	
	54	36	94
			134
E. Portlock, Meadows.	55	33	
	56	36	
	57	23	92
	58	25	
	59	27	
	60	10	62
			154
E. O. Dorney, 16, Norseman Avenue, Westbourne Park.	61	32	
	62	3	
	63	25	60
	64	14	
	65	18	
	66	17	49
			109
A E. Shiers, Yundi.	67	19	
	68	22	
	69	31	72
	70	34	
	71	22	
	72	29	85
			157
G. W. T. Symes, Echunga.	73	15	
	74	30	
	75	26	71
	76	24	
	77	19	
	78	30	73
			144
J. F. Smith, Meadows.	79	22	
	80	18	
	81	25	65
	82	31	
	83	29	
	84	16	76
			141
Arthur O. Dawkins, "Warrenbeyne", Gawler	85	38	
	86	34	
	87	34	106
	88	20	
	89	36	
	90	39	95
			201
Geo. Lomax, Yundi.	91	16	
	92	13	
	93	6	35
	94	9	
	95	25	
	96	24	58
			93

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
A. W. Mooney, Echunga.	97	11	
	98	26	
	99	17	54
	100	16	
	101	27	
	102	17	60
			114
H. C. Stacy, Meadows.	103	27	
	104	20	
	105	28	75
	106	24	
	107	20	
	108	15	59
			134
V. E. Williams, 57, Fairford Terrace, Semaphore Park.	109	39	
	110	29	
	111	17	85
	112	19	
	113	20	
	114	27	66
			151
T. R. Smart, Yundi.	115	33	
	116	11	
	117	28	72
	118	—	
	119	22	
	120	27	49
			121
C. T. Rodger, Echunga.	121	27	
	122	3	
	123	28	58
	124	27	
	125	22	
	126	25	74
			132
R. J. Underdown, Meadows.	127	23	
	128	31	
	129	26	80
	130	36	
	131	3	
	132	28	67
			147
B. Cooke, Kanmantoo.	133	—	
	134	35	
	135	33	68
	136	32	
	137	5	
	138	26	63
			131
W. M. Field, Yundi.	139	28	
	140	12	
	141	18	58
	142	4	
	143	26	
	144	31	61
			119
W. Restall, Echunga.	145	35	
	146	31	
	147	8	74
	148	13	
	149	25	
	150	22	60
			134
F. W. Gage, Meadows.	151	24	
	152	16	
	153	26	66
	154	25	
	155	32	
	156	23	80
			146
E. McKee, 5, Rose Street, Carrondown	157	28	
	158	23	
	159	22	73
	160	35	
	161	39	
	162	30	104
			177
W. C. Jones, Yundi.	163	11	
	164	20	
	165	18	49
	166	8	
	167	21	
	168	27	56
			105
D. J. Foxwell Echunga.	169	36	
	170	30	
	171	8	74
	172	20	
	173	17	
	174	23	60
			134
W. Sickort, Meadows.	175	24	
	176	27	
	177	37	88
	178	25	
	179	5	
	180	27	57
			145
Willow Bend Stud Poultry Farm, North Walkerville.	181	2	
	182	35	
	183	18	55
	184	33	
	185	26	
	186	37	96
			151
C. Guthridge, Yundi.	187	12	
	188	32	
	189	16	60
	190	26	
	191	16	
	192	18	60
			120
S. Lambert, Echunga.	193	18	
	194	33	
	195	30	81
	196	26	
	197	15	
	198	35	76
			157
G. W. Sykes, Yundi.	199	14	
	200	34	
	201	—	48
	202	20	
	203	—	
	204	21	41
			89

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
J. J. Devlin, Meadows.	205	8	
	206	31	
	207	12	51
	208	12	
	209	20	
	210	15	47
			98
B. R. Whitington, Yundi.	211	20	
	212	26	
	213	29	75
	214	12	
	215	30	
	216	24	66
			141
L. A. King, Meadows	217	27	
	218	11	
	219	18	56
	220	4	
	221	21	
	222	27	52
			108
W. R. Hedger, Yundi.	223	23	
	224	18	
	225	22	63
	226	32	
	227	—	
	228	4	36
			99
A. K. Suridge, Meadows.	229	1	
	230	—	
	231	16	17
	232	35	
	233	20	
	234	4	59
			76
J. C. Normandale Yundi	235	21	
	236	22	
	237	28	71
	238	29	
	239	27	
	240	17	73
			144
E. G. Mitchell, Meadows	241	27	
	242	—	
	243	30	57
	244	14	
	245	8	
	246	28	50
			107
R. W. McAlister, Yundi.	247	31	
	248	21	
	249	29	81
	250	35	
	251	14	
	252	16	65
			146
C. R. Wharton, Meadows.	253	14	
	254	25	
	255	25	64
	256	11	
	257	27	
	258	28	66
			130
R. H. Smith, Yundi.	259	15	
	260	26	
	261	9	50
	262	8	
	263	26	
	264	35	69
			119
F. J. Buck, Meadows	265	1	
	266	11	
	267	30	42
	268	26	
	269	11	
	270	14	51
			93
E. B. Gliddon, Yundi	271	31	
	272	24	
	273	26	81
	274	17	
	275	35	
	276	7	59
			140
C MacDonald, Echunga.	277	34	
	278	36	
	279	18	88
	280	36	
	281	18	
	282	27	81
			169
J. A. Grist, Yundi.	283	24	
	284	25	
	285	9	58
	286	4	
	287	25	
	288	29	58
			116
J. M. Lawson, Meadows.	289	6	
	290	24	
	291	28	58
	292	26	
	293	5	
	294	23	54
			112
Willow Bend Stud Poultry Farm, North Walkerville.	295	29	
	296	22	
	297	35	86
	298	34	
	299	25	
	300	33	92
			178
Murray Powell, Jupiter Creek.	301	3	
	302	30	
	303	5	38
	304	37	
	305	13	
	306	11	61
			99
W. H. L Norman, Echunga.	307	36	
	308	27	
	309	31	
		94	

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
A. A. Schroeder, **Montarra.**	310	5	
	311	24	
	312	32	
		61	
C. A. Maxwell, **Aldgate.**	313	36	
	314	16	
	315	38	
		90	
B. T. Moyle, **Montarra.**	316	35	
	317	23	
	318	28	
		86	
J. H. Dowling, **Glossop.**	319	34	
	320	7	
	321	37	
		78	
C. P. Hill, **Montarra.**	322	33	
	323	1	
	324	28	
		62	
A. P. Urlwin, **Balaklava.**	325	26	
	326	16	
	327	26	
		68	
G. H. Stockwell, **Montarra.**	328	8	
	329	22	
	330	4	
		34	
A. W. McDonald, **Angle Vale Road,** **Gawler.**	331	38	
	332	18	
	333	24	
		80	
E. A. Collins, **Montarra.**	334	31	
	335	37	
	336	26	
		94	
E. M. Horrocks, **Clare.**	337	28	
	338	28	
	339	34	
		90	
H. A. Dedman, **Montarra.**	340	31	
	341	19	
	342	6	
		56	
E. M. Topperwein, **1, Medway Street,** **Fullarton Estate.**	343	14	
	344	33	
	345	21	
		68	
Jas. G. Slee, **Montarra.**	346	35	
	347	8	
	348	37	
		80	
A. S. Weaver, **Montarra.**	349	11	
	350	32	
	351	12	
		55	
F. R. Walker, **Montarra.**	352	30	
	353	30	
	354	17	
		77	
F. G. Kinnish, **Montarra,** ***via* Willunga.**	355	27	
	356	2	
	357	27	
		56	
Total Class No. 1		**7,845**	
Class No. 2—Any Other Light Breed (Minorcas)—15 Birds Competing.			
Langmaid & Bettison, **Salisbury.**	358	11	
	359	10	
	360	18	39
	361	14	
	362	—	
	363	7	21
			60
V. F. Gameau, **71, Findon Road,** **Woodville.**	364	8	
	365	22	
	366	21	51
	367	8	
	368	3	
	369	7	18
			69
R. M. Yelland, **Cunliffe.**	370	2	
	371	5	
	372	18	
		25	
Total Class No. 2.			**154**
Class 3—Black Orpingtons—45 Birds Competing.			
A. G. Dawes, **Portrush Road,** **Glenunga.**	373	34	
	374	23	
	375	26	83
	376	15	
	377	27	
	378	28	70
			153
Willow Bend Stud **Poultry Farm,** **North Walkerville.**	379	40	
	380	12	
	381	26	78
	382	42	
	383	36	
	384	39	117
			195
H. J. Mills, **108, Edward Street,** **Edwardstown.**	385	3	
	386	17	
	387	16	36
	388	18	
	389	2	
	390	21	41
			77
K. Pennack, **Pooraka.**	391	25	
	392	24	
	393	14	63
	394	19	
	395	26	
	396	29	74
			137

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
H. H. Gallagher, Pooraka.	397	24	
	398	32	
	399	16	72
	400	19	
	401	3	
	402	32	54
			126
V. E. Williams, 57, Fairford Terrace, Semaphore Park.	403	25	
	404	10	
	405	18	
	405		
		53	
J. H. Dowling, Glossop.	406	25	
	407	—	
	408	5	
		30	
A. P. Urlwin, Box 80, Balaklava	409	10	
	410	—	
	411	5	
		15	
J. Rawe, Seaton Park.	412	30	
	413	15	
	414	5	
		50	
Raymoor Poultry Farm, William Street, Kilkenny.	415	22	
	416	11	
	417	16	
		49	
Total Class No. 3.		885	

Class No. 4—Any Other Heavy Breed—36 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
A. G. Dawes, Portrush Road, Glenunga. (Rhode Island Reds)	418	—	
	419	32	
	420	5	37
	421	36	
	422	32	
	423	28	96
			133
Willow Bend Stud Poultry Farm North Walkerville. (Rhode Island Reds.)	424	34	
	425	23	
	426	31	88
	427	4	
	428	9	
	429	40	53
			141
V. F. Gameau, 71, Findon Road, Woodville. (Rhode Island Reds.)	430	1	
	431	1	
	432	—	2
	433	5	
	434	22	
	435	18	45
			47
K. Pennack, Pooraka (Barnevelders.)	436	30	
	437	28	
	438	29	87
	439	32	
	440	6	
	441	36	74
			161
Raymoor Poultry Farm, William Street, Kilkenny. (Rhode Island Reds.)	442	12	
	443	15	
	444	32	
		59	
Eric F. Snow, 18, Mt. Barker Road, Glen Osmond. (Rhode Island Reds.)	445	—	
	446	4	
	447	25	
		29	
Total Class No. 4.		570	

SECTION 2—DRY MASH.

Class No. 5—White Leghorns—15 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
Arthur O. Dawkins, " Warrenbayne ", Gawler.	448	35	
	449	41	
	450	36	112
	451	37	
	452	34	
	453	34	105
			217
Willow Bend Stud Poultry Farm, North Walkerville.	454	41	
	455	32	
	456	37	110
	457	38	
	458	23	
	459	21	82
			192
A. J. Monkhouse, Woodside.	460	7	
	461	14	
	462	27	
		48	
Total Class No. 5.		457	

Class No. 7.—Black Orpingtons—6 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
Willow Bend Stud Poultry Farm, North Walkerville	463	34	
	464	16	
	465	16	66
	466	31	
	467	33	
	468	38	102
			168
Total Class No. 7			168

Class No. 8.—Rhode Island Reds—6 Birds Competing

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.	
Willow Bend Stud Poultry Farm, North Walkerville	469	28	
	470	45	
	471	38	111
	472	41	
	473	36	
	474	39	116
			227
Total Class No. 8			227

EGG-LAYING COMPETITION—continued.

SECTION 3—WET MASH.

Class No. 9.—Any Breed—27 Birds Competing. (Home Project Utility Section).

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 26th May, 1936.
Peter Western, Ascot Park School. (White Leghorn.)	475	28
Peter Western, Ascot Park School. (White Leghorn.)	476	18
Stanley Pratt, Abattoirs School. (White Leghorn.)	477	24
Anthony Rix, Williamstown. (White Leghorn.)	478	36
John Short, Hamley Bridge School. (White Leghorn.)	479	38
Marion Brooks, Sandy Creek School. (White Leghorn.)	480	—
Owen Robinson, Ascot Park School. (White Leghorn.)	481	23
Eric Sincock, 133, Anzac Highway, Grassmere. (White Leghorn).	482	10
Reg W. Andrew, 61, South Road, Black Forest. (White Leghorn.)	483	30
Robert Fulton, 11, Glengarry Avenue, Glandore. (White Leghorn.)	484	8
Ray Couche, Thebarton School. (White Leghorn.)	485	32
Warren Hannaford, Paracombe School. (White Leghorn.)	486	27
Herbert Gwynne, Gawler School. (White Leghorn.)	487	28
Robert H. King, Tarlee School. (White Leghorn.)	488	7
Stanley W. Pethick, Ascot Park School. (White Leghorn.)	489	24
William Horne, Woodville High School. (White Leghorn.)	490	28
Bernice Jennings Mylor School. (White Leghorn.)	491	20
Ross. W. Schulz, Willunga School. (White Leghorn.)	492	1
Gordon Heard, Camden School. (White Leghorn.)	493	24
Laurel White, Williamstown School. (Black Orpington.)	494	27
David Hart, Unley High School. (Black Orpington.)	495	43
Bob Sweetland, Thebarton School. (Black Orpington.)	496	6
Malcolm Booth, Bridgewater School. (Black Orpington.)	497	18
Keith Oliver, McLaren Vale School. (Black Orpington.)	498	23
Colin Kies, Sandy Creek School. (Minorca.)	499	4
Alan Yelland, Cunliffe. (White Leghorn.)	500	31
Kenneth Ekers, Mt. Compass. (Black Orpington.)	501	47
Total Class No. 9		605

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1936-37, CONDUCTED AT PARAFIELD POULTRY STATION.

LEADING SCORES TO WEEK ENDED 26th MAY, 1936.—FIRST GRADE EGGS ONLY.

SECTION I.—WET MASH.

Class 1.—White Leghorns.

(351 birds competing.)

	Eggs Laid.	Bird Nos.
Singles—		
A. O. Dawkins	39	90
V. E. Williams	39	109
E. McKee	39	161
Trios—		
A. O. Dawkins	106	85-87
E. McKee	104	160-162
Willow Bend Stud Poultry Farm	96	184-186

Class 1.—*White Leghorns*—continued.

	Eggs Laid.	Bird Nos.
Teams—		
A. O. Dawkins	201	85–90
Willow Bend Stud Poultry Farm	178	295–300
E. McKee	177	157–162

Class 2—*Any Other Light Breed.*

(Minorcas—15 birds competing.)

Singles—		
V. F. Gameau	21	366
V. F. Gameau	22	365
Trios—		
V. F. Gameau	51	364–366
Langmaid and Bettison	39	358–360
Teams—		
V. F. Gameau	69	364–369
Langmaid and Bettison	60	358–363

Class 3.—*Black Orpingtons.*

(45 birds competing.)

Singles—		
Willow Bend Stud Poultry Farm	42	382
Willow Bend Stud Poultry Farm	40	379
Willow Bend Stud Poultry Farm	39	384
Trios—		
Willow Bend Stud Poultry Farm	117	382–384
A. G. Dawes	83	373–375
Teams—		
Willow Bend Stud Poultry Farm	195	379–384
A. G. Dawes	153	373–378

Class 4.—*Any Other Heavy Breed.*

(36 birds competing.)

Single—		
Willow Bend Stud Poultry Farm (Rhode Island Reds)	40	429
K. Pennack (Barnevelders)	36	441
A. G. Dawes (Rhode Island Reds)	36	421
Trios—		
A. G. Dawes (Rhode Island Reds)	96	421–423
Willow Bend Stud Poultry Farm (Rhode Island Reds)	88	424–426
K. Pennack (Barnevelders)	87	436–438
Teams—		
K. Pennack (Barnevelders)	161	436–441
Willow Bend Stud Poultry Farm (Rhode Island Reds)	141	424–429

SECTION II.—DRY MASH.

Class 5.—*White Leghorns.*

(15 birds competing.)

Singles—		
Willow Bend Stud Poultry Farm	41	454
A. O. Dawkins	41	449
Willow Bend Stud Poultry Farm	38	457
Trios—		
A. O. Dawkins	112	448–450
Willow Bend Stud Poultry Farm	110	454–456
Teams—		
A. O. Dawkins	217	448–453
Willow Bend Stud Poultry Farm	192	454–459

Class 7.—Black Orpingtons.

(6 birds competing.)

Singles—	Eggs Laid.	Bird Nos.
Willow Bend Stud Poultry Farm	38	468
Willow Bend Stud Poultry Farm	34	463

Class 8.—Rhode Islands Reds.

(6 birds competing.)

Single—		
Willow Bend Stud Poultry Farm	45	470
Willow Bend Stud Poultry Farm	41	472

SECTION III.—WET MASH.

Class 9.—Any Breed (Home Project Utility Section).

(27 birds competing.)

Name. School. Breed.	Eggs Laid.	Bird Nos.
Kenneth Ekers, Mount Compass (Black Orpington)	47	501
David Hart, Unley High (Black Orpington) ..	43	495
John Short, Hamley Bridge (White Leghorn) ..	38	479
Anthony Rix, Williamstown (White Leghorn) ..	36	478

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April, 1935 to 31st May, 1936.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal, 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 30th April, 1936.	No. Eggs Laid Month of May, 1936.	Total Eggs Laid 1st April, 1935, to 31st May, 1936.
No. 1 Test	7,698	195	7,893
No. 2 Test	7,885	180	8,065
No. 3 Test	8,509	191	8,700
No. 4 Test	6,913	100	7,013
No. 5 Test	7,094	85	7,179

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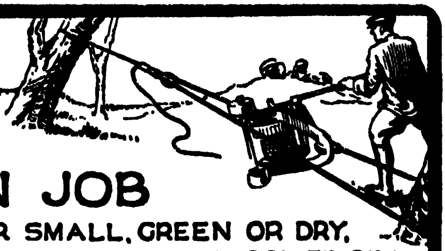

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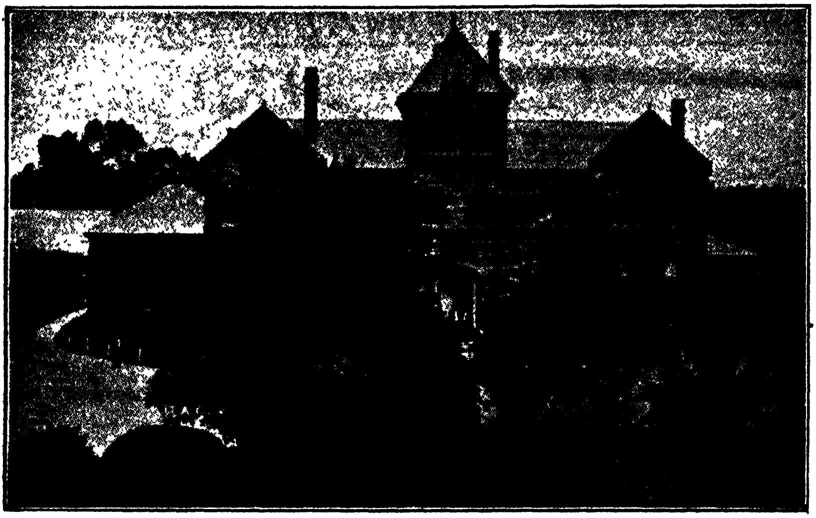

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A REVIEW OF THE PAST FRUIT DRYING SEASON ON THE IRRIGATION AREAS.

[By F. R. Arndt (Horticultural Instructor).]

The most noteworthy feature of the early part of the season was the comparatively light flowering of the Sultana vines in most vineyards.

Judging by the number of bunches on the vines, many growers early in the season estimated that their Sultana crops would be from 30 to 50 per cent. lower than the previous year, but as the smaller number of bunches was in many instances counterbalanced by a better setting of berries, making for tighter and heavier bunches, a better crop resulted than was at first anticipated.

Vineyards in which Sultana vines flowered well were chiefly those that had suffered some frost damage—but not of an excessive nature—during the previous season, and consequently in which the strength of the vines had not been depleted by the heavy cropping. Currant and Gordo Muscat vines flowered well, and a good setting of berries followed. As regards deciduous trees, the setting of apricots was not as heavy as the previous season, but peaches generally set good crops.

No spring frosts of a serious nature were experienced, and no frost damage to crops was incurred.

Heavy January Rains.

Indications during the spring and early summer months pointed to the production of satisfactory crops, but early in January heavy monsoonal rains occurred, averaging 3in. to 5½in., according to locality. These had the effect of seriously damaging currant grapes and a portion of the apricot crop. A considerable proportion of the apricot crop had been harvested prior to the rains, and so escaped injury, but where freshly-cut fruit became wet by rain, or remained moist as a result of the unusual humidity of the air, considerable damage from mould resulted, while much of the fruit still on the trees either crocked or collapsed.

Damage to the Currant Crop.

Of the various fruits currant grapes suffered most severely from the rain, which caused ripened berries to split and mould to form in the centres of bunches. The losses sustained varied considerably in different vineyards, chiefly on account of varying degrees of ripeness of the berries, being as high as 80 per cent. and over in places, while in other holdings the losses were comparatively light. All berries that were ripening and which had commenced to colour split badly, whereas fruit that was in the hard, green state practically escaped rain damage. This feature was very marked on the properties of several Berri growers whose vines are situated in frost pockets and who, to avoid frost losses, pruned early in September. The result was that the fruit was still quite green when the rain arrived, and so practically suffered no injury from this cause.

Late pruning, however, cannot be regarded as a means of saving fruit from rain damage, as rain may occur at any time, and had the rains this season taken place several weeks later the fruit on the late-pruned vines would also have been damaged. In the aggregate, fruit losses sustained by the currant vines were about 50 per cent. or a little more of the crop.

During harvesting, totally damaged bunches had, of course, to be discarded, and only those that were reasonably free from mould could be selected. As in many instances the bunches were only partially damaged, only the good portions of these could be harvested, and the mouldy parts had to be cut out. This necessity made harvesting operations slow and costly, and difficulties were also encountered when spreading the fruit on to the racks, as damaged bunches that had been overlooked in picking had to be rejected. Considerable care had also to be exercised when removing the fruit from the drying racks, as numerous dry lumps of moulded fruit were common, and these had to be discarded when boxing up. This culling was done either by hand picking or by running the fruit through a coarse sieve before delivery to the packing houses for grading and further treatment.

The Sultana Crop.

The rain which so seriously damaged the currant grapes did not have a similar detrimental effect on the sultana crop, although slight splitting of sugared berries occurred in places, and black spot attacked the berries of vines situated in low-lying positions on several vineyards. The great bulk of the crop, however, was in very good condition during the earlier part of the season, and some very good samples of dried fruit were produced during that period.

Later in the season, however, from 60 to 70 points of rain fell, and this had the effect of slightly splitting a number of berries near the stem end. Although hardly noticeable when picking, this injury showed up after the fruit had been dipped, and resulted in a much darker sample of dried fruit than was produced earlier in the season.

Sultana Dips.

The "battle of the dips" still continues, and the ideal of a "fool-proof dip" has not yet been evolved. During the past season sultana grapes have been processed by means of the cold potash dip, the standard mixed dip, the caustic modified hot dip, and occasionally even by the boiling caustic dip. During the early part of the season the majority of the growers made use of the standard mixed dip, and a much smaller number of the cold potash dip.

Owing to the inspection of dried fruit at the packing houses being more stringent this season than usual in regard to green tinge on sultana berries, a considerable quantity of fruit was rejected at one period and sent back to the growers for further bleaching. This had the effect of causing a number of growers to treat the remainder of their fruit by means of the modified hot caustic dip, by which process a more amber but somewhat darker sample of dried fruit was produced than by the use of the standard mixed dip.

As the highest prices on the English market are realised by sultanas of a light golden colour, it should be the object of the grower whenever possible to produce this class of dried fruit. It is therefore a retrograde step for growers to adopt a dipping process which will give a darker sample of dried fruit than they have previously produced.

Removal of the Green Tinge.

During recent years a number of growers have experienced considerable difficulty in removing the green tinge from the dried sultana berries when the fruit has been processed by either the cold potash or mixed dip methods. The chief causes of fruit remaining green after it has been dried are either too early picking or insufficient bleaching.

In regard to early picking many growers in their haste to complete their harvest gather their fruit before it is sufficiently ripe. If sultana grapes are harvested when the surgar content has reached 12 degrees Baume a satisfactory sample of dried fruit is generally obtained if weather conditions during the drying period are favourable, but if the fruit is picked when the sugar content is one or more degrees Baume below this figure, then not only will the fruit dry out much lighter in weight, but will generally be much greener in colour as well.

COMING SOON—A NEW
"CATERPILLAR" DIESEL FARM
TRACTOR—THE "RD4."

Smaller than any of the Diesel tractors that have, until now, been included in the "Caterpillar" line, the "RD4" extends Diesel economies to new thousands of power users.

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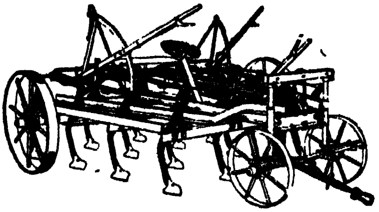

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18 tyne, 9ft. cut.

Draught device entirely overhead gives
Exceptional Clearance for surface trash.

SUNDUKE BRIDLE-DRAUGHT S. J. SCARIFIER.
PATENTED OVERHEAD RELEASE GEAR.
Praised by users for its outstanding work in cutting out all weeds and leaving a perfect seed-bed and mulch.
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USE IT—
In preparation of Spray Mixtures for Fruit Trees and Vines.
For Treatment of Foot-rot in Sheep.
As a Drench for Worms in Sheep.
For Wheat Pickling.

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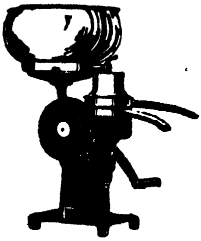

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AWARDED FIRST PRIZE!
Royal Agricultural Society's Show, 1935.

Allowance made for old Separator, and balance on easy terms.

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Grenfell Street, Adelaide.

With fruit that is reasonably mature before harvesting, not much difficulty will be experienced in bleaching out any green tinge it may have after it has been removed from the drying racks and placed on hessians or "Sisalkraft" to finish off in the sun. It is, however, with sultanas processed from insufficiently ripened fruit that the green tinge is difficult to remove, even after exposure to the sun on hessians for several days. In such cases, if the fruit is well moistened with water, allowed to sweat by being bundled up in hessians for several hours during the heat of the day, and then spread out again, a considerable amount of browning will take place, while, while overcoming the green tinge, will nevertheless not give that clear golden colour that may be obtained from better-ripened fruit.

Washing Cold-dipped Fruit.

To obtain the best results from the cold potash method the fruit, after its removal from the drying racks, should first be spread on hessians placed in the sun to get quite dry. It should then be washed in a potash solution of about 1 degree Beaume strength to which has been added 1 to 1½ pints of olive oil per 50galls. of water, and again placed on hessians in the sun to complete the drying process. This washing not only removes much of the surplus potash adhering to the berries, but it also has the effect of assisting the removal of the green tinge from the fruit.

The Gordo Crop.

Commencing with a good flowering and setting of fruit, and helped later on in the season by comparatively mild summer weather, which did not to any appreciable extent scorch the berries (as is often the case during very hot summers), Gordo vines this season produced the most prolific crops experienced for a number of years. Although much of the fruit found its way into the wineries, owing to the present good demand for Muscat grapes for winemaking, there was still a considerable quantity dried for lexias.

In preparing the fruit for drying the dipping processes used were either those of the modified hot caustic dip method, at temperatures varying from 190 degrees to 200 degrees Fahr., or the standard mixed dip process, at a temperature of about 190 degrees Fahr. Owing to fine, dry autumn weather, conditions were very favourable for the drying of Gordo grapes, and resulted in a good average sample of dried fruit being obtained.

STATE OF SOUTH AUSTRALIA.

FINAL RESULTS OF CEREAL AND HAY HARVEST, 1935-36.

[A. W. Bowden, Government Statist.]

Wheat, 1935-36, 31,615,744bush.; average per acre, 10.58bush.

Wheat, 1934-35, 27,455,600bush.; average per acre, 8.61bush.

There are still a few minor wheat districts where the completion of the collection has been delayed, and a number of odd returns from farmers in other districts outstanding, but, rather than further delay the final results, a safe estimate has been made for all these, and hence the totals now submitted may be accepted as final.

I. SURVEY OF CONDITIONS.

It will be remembered that the official estimate of the wheat harvest published in December, 1935, was 32,300,000bush., being based on reports received during the first week in December. The decrease of nearly 700,000bush. to the final result now published (31,615,744bush.) is more than accounted for by the decrease in the Western Division, where take-all and rust became more prevalent than expected, and where thunderstorms with heavy winds and rains caused loss by shedding and bleaching. In the other Divisions of the State, the reports indicate that wheat was not so badly affected by the storms, and barley was only affected to a slight extent, the actual yield being 6,493,983bush. compared with the estimate of 6,800,000bush. Oats, however, were badly affected in every Division, the losses being so severe that only 2,380,908bush. were harvested compared with the estimate of 3,150,000bush. The hay crop was estimated at 600,000 tons, and 575,471 tons were cut.

II. GROWERS AND ACREAGE SOWN.

Wheat Growers.—There were 13,790 (14,201) growers of wheat for all purposes for the season 1935-36, and of this number 12,713 (13,053) reaped areas for grain. Approximately 1,765 (1,759) reaped areas of under 50 acres. Sharefarmers counted once only.

Acreage.—The grand total acreage sown to wheat, barley, and oats for all purposes was 4,317,146 (4,497,481) acres, a decrease on the previous year of 180,335 acres.

Wheat.—3,210,238 (3,459,380) acres: Grain, 2,989,490 (3,188,225) acres; hay, 213,703 (264,373); fed off, &c., 7,045 (6,782).

Barley.—414,419 (334,462) acres: Grain, 393,741 (316,807); hay, 3,389 (3,128); and fed off, 17,289 (14,527).

Oats.—692,489 (703,639) acres: Grain, 299,771 (367,192); hay, 334,529 (280,710); fed off, &c., 58,189 (55,737).

III. PRODUCTION AND AVERAGES PER ACRE.

Wheat.—31,615,744bush. (27,455,600bush.), increase 4,160,144bush., averaging 10.58bush. (8.61bush.) per acre.

Barley.—6,493,983bush. (5,682,923bush), increase 811,060bush., averaging 16.49bush. (17.94bush.) per acre. This yield exceeds the previous record crop of 6,070,161bush. in 1932-33.

Oats.—2,380,908bush. (2,412,117bush.), decrease 31,209bush. on previous year's record, averaging 7.94bush (6.57bush.) per acre.

Hay (wheaten, oaten, and barley).—575,471 (550,020) tons, increase 25,451 tons, averaging 1.04 (1.00) tons per acre. Distributed as follows:—Wheaten 246,164 (298,896), oaten 326,371 (247,603), barley 2,936 (3,521) tons.

IV. BENEFITS FROM FALLOWING.

Of last season's wheat crop 2,095,668 (2,233,258) acres sown on fallow yielded 26,846,254bush. (24,608,163bush.) averaging 12.81bush. (11.02bush.) per acre, and 893,822 (954,967) acres sown on unfallowed land yielded 4,769,490bush. (2,847,437bush.) averaging only 5.34bush. (2.98bush.) per acre, thus making the State average 10.58bush. (8.61bush.) per acre.

FINAL RESULTS OF CEREALS AND HAY, 1935-36.

Wheat, 1935-36—Acres, 2,989,490; yield, 31,615,744bush.; average, 10.58bush.

Wheat, 1934-35—Acres, 3,188,225; yield, 27,455,600bush., average, 8.61bush.

1. *Acreage Cropped.*

Divisions.	Total Wheat, Barley, Oats.	Grain.			Hay (W.B.O.).	Fed off Areas. (W.B.O.).
		Wheat.	Barley.	Oats.		
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Central	929,040	458,911	252,163	37,864	166,873	13,229
Lower North	975,009	729,535	78,617	25,816	114,137	26,904
Upper North	301,735	279,341	1,071	3,280	17,061	982
South-Eastern	87,116	24,399	10,282	23,515	25,169	3,751
Western	1,102,974	852,381	26,878	103,915	99,911	19,889
Murray Mallee	921,272	644,923	24,730	105,381	128,470	17,768
Total, 1935-36	4,317,146	2,989,490	393,741	299,771	551,621	82,523
Total, 1934-35	4,497,481	3,188,225	316,807	367,192	548,211	77,046
Increase or decrease	−180,335	−198,735	76,934	−67,421	3,410	5,477

2. *Production of Grain and Hay.*

Divisions.	Grain.						Hay (W.B.O.).
	Wheat.		Barley.		Oats.		
	Bush.	Av.	Bush.	Av.	Bush.	Av.	Tons.
Central	6,875,571	14·98	4,637,866	18·39	456,418	12·05	252,999
Lower North	10,963,319	15·03	1,065,168	13·55	316,012	12·24	114,965
Upper North	1,854,371	6·64	11,852	11·07	23,238	7·08	15,471
South-Eastern	459,433	18·83	189,425	18·42	405,049	17·23	31,084
Western	7,253,354	8·51	378,795	14·09	732,006	7·04	78,505
Murray Mallee	4,209,696	6·53	210,877	8·53	448,185	4·25	82,447
Total, 1935-36	31,615,744	10·58	6,493,983	16·49	2,380,908	7·94	575,471
Total, 1934-35	27,455,600	8·61	5,682,923	17·94	2,412,117	6·57	550,020
Increase or decrease	4,160,144	1·97	811,060	−1·45	−31,209	1·37	25,451

3. *Five Years' Comparison.*

Year.	Wheat.			Rainfall Agric. April-Nov.	Value of Oversea Exports.	
	Area.	Yield.	Average Per Acre.		Wheat and Flour.	Barley.
	Acres.	Bush.	Bush.	Inches.	£	£
1930-31	4,180,513	34,871,526	8·34	11·31	3.038,811	342,732
1931-32	4,071,370	48,093,102	11·81	13·27	5,901,673	413,034
1932-33	4,066,782	42,429,614	10·43	14·70	5,225,173	319,877
1933-34	3,821,795	35,373,466	9·26	12·15	2,731,285	294,071
1934-35	3,188,225	27,455,600	8·61	11·97	4,139,633	345,550
Mean	3,865,737	37,644,661	9·69	12·68	4,207,315	343,053
1935-36	2,989,490	31,615,744	10·58	12·38	3,716,149 (*a*)	271,251 (*a*)

(*a*) 10 months.

The following return illustrates the benefit from cropping wheat on fallowed land:—

Grown On	Wheat Yield Per Acre.				
	1935-36.	1934-35.	1933-34.	1932-33.	1931-32.
	Bush.	Bush.	Bush.	Bush.	Bush.
Fallow	12·81	11·02	11·60	12·86	14·81
Not fallowed	5·34	2·98	4·78	6·86	7·57
Total	10·58	8·61	9·26	10·43	11·81
Rainfall—	Inches.	Inches.	Inches.	Inches.	Inches.
April-Nov.	12·38	11·97	12·15	14·70	13·27

V. Rainfall.

The mean monthly rainfall over the agricultural areas of the State is specially computed and recorded in comparison with the averages for the past 30 years. The following are the particulars in inches of the rainfall from April to November for the chief Divisions of the State:—

Year.	Whole State.	Central.	Lower North.	Upper North.	South-East.	Western.	Murray Mallee.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
Rainfall—							
1935	12·38	16·58	10·60	5·62	19·82	11·89	9·81
1934	11·97	15·57	11·91	8·28	20·13	9·61	10·11
Average 5 years	12·89	16·42	12·26	8·33	19·41	12·00	10·10
Average 30 years	12·73	16·14	12·36	9·00	19·55	11·12	10·51
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Wheat Yield—							
1935	10·58	14·98	15·03	6·64	18·83	8·51	6·53
1934	8·61	13·17	14·49	7·44	19·61	4·25	4·92
Average 5 years	10·14	14·40	15·44	8·24	15·34	7·07	6·42

VI. The Marketing of the Crop.

The carry forward was 1,500,000bush., and with the 1935-36 crop a total of 33,100,000bush. was available; 3,250,000bush. are required for seed, and probably 4,750,000bush. for home consumption, including feed for stock and a three months' supply carry forward before the next crop is matured; less this 8,000,000bush., the balance available for export was approximately 25,000,000bush. To date of this bulletin it is estimated that 17,000,000bush. has been exported, leaving a balance available for shipping of 8,000,000bush.

VII. Five Months' Oversea Exports (December, 1935, to April, 1936).

The principal countries to which cereals have been exported this season compared with last season is as follows:—*Wheat* (bushels)—United Kingdom, 8,749,045 (8,397,403); China, 655,993 (3,594,793); Japan, 361,160 (3,459,142). *Flour* (tons)—United Kingdom, 14,002 (7,857); Japan—(8,060); Egypt, 4,891 (6,697). *Barley* (bushels)—United Kingdom, 911,288 (362,586); Belgium, 215,258 (1,107,562); New Zealand, 346,390 (264,028); Japan, 33,672 (44,636).

VIII.—Area Intended to be Cropped, 1936-37.

Particulars have been received from farmers in all hundreds of the State as to the areas intended to be sown for the 1936-37 season. These indicate that the following areas were intended to be sown for grain, hay, and fodder:—3,350,000 (3,210,238) acres with wheat, 360,000 (414,419) acres with barley, and 790,000 (692,489) acres with oats—a total for these three cereals of 4,500,000 (4,317,146) acres, or approximately the same as two years ago. The increase in oats is principally in the Western division.

McLAREN FLAT PRUNING COMPETITIONS.

The Annual Pruning Competitions conducted by the McLaren Flat Branch of the Agricultural Bureau were held on 30th May on the properties of Messrs. J. Ingoldby, F. B. Wilson, and R. Nottage. Entries were a little larger than last year in most sections, and the judges stated that the work was of a very high standard.

VINE SECTION.

[*Judges.—Spur*: Messrs. G. Cox and H. H. Orchard (Horticultural Instructor). *Rod*: Messrs. J. L. Williams (Viticultural Instructor, R.A.C.) and J. B. Harris (Horticultural Instructor).]

Name.	Spur.	Rod.	Aggregate.
F. H. Schurgott	90	94	184
M. Powell	91	89	180
C. Sigston	87	92	179
B. Powell	87	92	179
Ivan Dyer	92	86	178
E. P. Filsell	81	97	178
C. Air	82	95	177
A. Air	82	95	177
Bick Elliott	86	91	177
Reg. Townsend	83	94	177
W. Stillwell	86	91	177
H. Storer	85	92	177
R. Deane	86	90	176
P. Penney	84	92	176
A. T. Leske	83	93	176
J. Sigston	82	93	175
Ralph Townsend	82	93	175
C. Bruce	83	92	175
F. Price	82	93	175
R. Sibley	82	93	175
Ron. Elliott	83	92	175
L. Ward	80	94	174
A. Cooper	84	90	174
H. Eatts	80	93	173
R. Rau	84	89	173
F. H. Grohs	81	92	173
E. R. Grohs	82	90	172
R. Forrest	82	90	172
R. Bilney	83	89	172
Reg. Elliott	83	89	172
R. Stanfield	85	87	172
S. Penney	83	88	171
L. Stanfield	86	84	170
S. Maple	86	84	170
F. M. Elliott	86	84	170
C. Cassatta	81	89	170
L. Osmond	80	90	170
A. Davey	84	85	169
Ron. Ward	85	84	169
A. Trembath	79	90	169
D. Broughton	85	84	169
K. Broughton	82	87	169
O. E. Manser	79	90	169
H. Baldock	81	88	169
J. Piercey	83	85	168
P. H. Schimdt	81	87	168
A. Baxter	80	87	167
A. H. King	82	85	167
L. Penney	84	83	167
F. Stillwell	81	85	166
Rex. Ward	85	81	166
A. Osmond	79	87	166
A. Sparrow	79	87	166

VINE SECTION.—*Continued.*

Name.	Spur.	Rod.	Aggregate.
J. Ordish	81	85	166
W. R. Osmond	84	81	165
K. Robertson	83	82	165
R. Wickham	85	79	164
E. Waye	83	81	164
W. C. Ledgard	82	82	164
R. Low	83	80	163
E. Baldock	79	84	163
A. Tickle	80	82	162
R. LePoidevin	83	79	162
D. Nicolle	82	80	162
L. J. Manser	81	81	162
W. R. Parmenter	81	80	161
J. Stewart	80	81	161
C. T. Vinall	79	79	158
N. R. LePoidevin	78	79	157
F. Alcock	76	79	155
E. Strout	82	—	82
D. J. Bain	80	—	80
G. Townsend	78	—	78

CURRANT SECTION.

[*Judges*: Messrs. H. H. Howard and N. Low.]

Name.	Points.
R. Low	95
C. Sigston	94
Bick Elliott	93
Ralph Townsend	93
F. M. Elliott	92
Reg. Elliott	92
Ivan Dyer	92
S. Maple	92
C. Air	91
R. Rau	91
J. Sigston	91
P. Penney	91
A. Trembath	91
S. Penney	91
L. Penney	91
R. Deane	91
O. Manser	90
L. Ward	90
D. Nicolle	90
R. Bilney	90
H. Eatts	89
W. Ward	89
R. Wickham	89
W. C. Ledgard	89
A. Osmond	89
E. Strout	89
K. Robertson	88
D. Broughton	88
K. Broughton	88
Ron Ward	88
Reg. Townsend	88
C. Bruce	88
B. Powell	87
R. Stanfield	86
G. Townsend	86
A. Air	85
C. Cassatta	85

FRUIT TREE SECTION.

[*Judges*: Messrs. R. Fowler (Manager, Blackwood Orchard) and E. Leishman (Horticultural Instructor).]

Name.	Apricot.	Prune.	Aggregate.
Reg. Elliott	89	87	176
F. M. Elliott	87	88	175
A. T. Leske	88	84	172
Bick Elliott	88	82	170
L. Ward	85	84	169
J. Sigston	90	78	168
D. Nicolle	87	80	167
Ralph Townsend	85	81	166
A. Trembath	83	82	165
W. C. Ledgard	80	85	165
D. J. Bain	78	85	163
B. Powell	80	82	162
R. Low	78	84	162
G. Ward	80	80	160
Ron. Ward	78	81	159
K. Robertson	79	79	158
C. Sigston	86	—	86
F. Penney	79	—	79
H. Eatts	—	83	83

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow July to April.	Per Herd during April.	Per Cow during April.	Per Cow July to April.	
			lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/H	8	7·40	2,928	366·00	4,692·89	151·84	18·98	241·21	5·19
7/P ..	29·43	26·40	13,483	458·11	5,702·58	638·64	21·70	261·79	4·74
7/TT	17	16·10	6,903	406·05	6,172·60	291·18	17·13	258·42	4·22
7/DDD	14	12·60	6,420	458·57	6,647·70	280·02	20·00	309·85	4·36
7/BBB	76·97	66·73	28,853½	374·81	5,015·82	1,180 75	15·33	217·83	4·11
7/EEE	12·50	7·13	4,041½	323·32	4,839·47	187·03	14 96	238·78	4·63
7/GGG	17·90	14·60	3,693	206·31	4,227·47	188·98	10·56	195·00	5·12
7/HHH	14	11·20	2,976	212·57	5,407·48	103·29	7·38	177·05	3·47
7/III	20	15·60	7,650	382·50	6,165·65	258·59	12·93	212·15	3·38
7/KKK	25	19·80	6,051	247·56	5,700·57	279·33	11·42	266·55	4·60
7/MMM	15·37	14·10	4,817	313·40	4,776·22	258·76	16·84	249·94	5·37
7/NNN	15·43	11·47	5,633½	365·10	6,047·26	240·89	15·61	258 36	4·28
7/OOO	27	20·90	7,837½	290·28	4,900·88	302·24	11·19	193·40	3·85
7/PPP	18·03	13·30	7,249½	402·08	4,718·41	339·97	18·86	226·16	4·69
7/QQQ	22	11·80	3,312	150·54	5,101·17	173·24	7 87	238·85	5·23
7/RRR	23·63	20·16	6,127½	259·31	4,622·49	312·57	13·23	208·12	5·10
7/SSS	8	4·70	2,788½	348·56	6,346·47	93·61	11 70	249·18	3·36
7/TTT	8	6·57	3,965½	495·69	6,279·06	158·82	19·85	249·34	4·03
7/UUU	21·67	17 53	4,584	211·53	3,965·10	190·56	8·79	167 39	4·16
7/VVV	20	18·27	7,441	372·05	4,870·35	327·14	16·36	213·84	4·40
7/WWW	19·43	18·33	9,409	484·25	4,045·31	372·33	19·16	165·92	3·96
7/XXX	25	19·93	6,545	261·80	3,587·38	236·41	9 46	136·09	3·61
Means	20·83	17·03	6,941·32	333·16	5,267·71	298 46	14·33	228·26	4·30

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow October to April.	Per Herd during April.	Per Cow during April.	Per Cow October to April.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	30·57	16·83	11,230	367·33	4,012·85	597·62	19·55	214·14	5·32
5/D ..	32·63	20·33	11,415½	349·81	3,232·39	619·13	18·97	173·92	5·42
5/E ..	38	31·73	17,477½	459·93	3,693·40	958·22	25·22	193·33	5·48
5/R .	68·03	45·37	22,031	323·83	2,838·31	1,006·05	14·79	127·82	4·57
5/Z ..	42	33·33	26,342½	627·20	4,572·22	1,348·13	32·10	236·48	5·12
5/EE	16	15	7,140	446·25	4,423·18	419·54	26·22	226·97	5·88
5/XX	26	18·17	8,571½	329·67	2,497·88	460·27	17·70	129·04	5·37
5/YY	7·10	4·83	3,187	448·86	2,487·83	168·94	23·79	126·55	5·30
5/AAA	19	13·60	6,224	327·58	3,822·04	360·01	18·95	192·70	5·78
5/BBB	18	12·17	3,542	196·78	2,806·91	203·68	11·32	141·56	5·75
5/EEE	26	20·40	12,333	474·34	3,482·02	586·17	22·55	155·71	4·75
5/HHH	12·13	10·03	3,864	318·54	3,358·97	166·94	13·76	141·65	4 32
5/JJJ	25·40	13·67	10,484	412·73	2,268·15	492·65	19·40	134·99	4·70
5/AA	18·20	12·17	6,584	361·75	3,591·70	319·97	17·58	158·68	4·86
5/KKK	15·13	11·03	5,042	333·24	2,191·19	258·32	17·07	106·50	5·12
5/LLL	15·40	9·87	3,191	207·21	3,283·45	143·83	9·34	147·00	4·51
5/RR	23·23	15·13	6,303½	271·35	2,879·03	339·56	14·62	153·47	5·30
5/MMM	32	21·30	12,798	399·93	4,275·75	676·35	21·14	205·72	6·61
5/NNN	25	20	8,212	328·48	3,447·38	458·91	18·36	179·19	5·59
5/OOO	22·07	21·23	18,093	819·74	5776·75	810·86	36·74	240·58	4·48
5/PPP	29·80	14·87	7,311	245·34	2,785·43	293·49	9·85	113·95	4·01
5/QQQ	29	26·3	8,935½	308·12	2,791·42	479·05	16·52	147·62	5·36
Means	25·94	18·50	10,014·18	386·04	3,411·42	507·62	19·57	176·66	5·07

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow December to April.	Per Herd during April.	Per Cow during April.	Per Cow December to April.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	15·23	10·27	6,128½	402·39	1,717·29	289·32	19·00	83·35	4·72
6/C ..	22·23	19·83	11,541½	519·14	3,065·38	528·25	23·76	184·59	4·58
6/Y ..	14	14	10,200	728·55	4,112·12	428·75	30·63	173·18	4·21
6/Ff .	31·67	30·40	21,480	678·22	3,833·32	857·77	27·08	156·86	3·99
6/Kk	16	11·87	7,064	441·50	2,373·86	283·25	17·70	93·20	4·01
6/Ll .	24	20	11,970	498·74	2,894·21	430·52	17·94	104·01	3·60
6/Oo .	23·20	18·43	12,655½	545·46	3,532·50	532·87	22·97	150·94	4·22
6/Ss .	17·40	15·23	14,744	847·34	4,440·64	505·69	29·06	158·42	3·43
6/Tt .	28	25	16,965	605·88	3,556·44	632·40	22·59	147·17	3·73
6/Vv .	28	24·93	21,305	760·89	4,055·66	1,018·37	36·37	186·49	4·78
6/Xx	27	21·93	15,342½	568·23	3,259·79	610·21	22·60	130·80	3·98
6/Ddd	24·73	20·73	12,157	491·56	3,330·46	505·87	20·46	136·01	4·16
6/Mmm	10	9	8,865	886·50	3,794·24	315·54	31·55	149·57	3·56
6/Ooo	28	26·47	21,744½	776·58	4,062·31	897·34	32·05	172·07	4·12
6/Rrr	39	32·17	22,711	582·33	3,448·92	1,011·48	25·94	135·92	4·45
6/Sss	35·87	32·37	25,649½	715·07	3,867·66	1,030·07	28·72	149·65	4·02
6/Ttt	27	19·40	15,765	583·88	3,079·24	743·16	27·52	141·77	4·71
6/Pp .	22·60	21	12,195	539·57	3,069·11	626·04	27·70	153·20	5·13
6/Uuu	65	63·53	40,185	618·23	3,309·02	1,767·91	27·20	141·63	4·40
6/Vvv	40	36·13	18,833	470·83	3,137·10	732·00	18·30	121·21	3·89
6/A ..	10	4	1,125	112·50	1,399·70	58·46	5·85	73·53	5·20
6/Ppp	22·93	19·87	15,712	685·20	3,962·56	626·16	27·31	163·48	3·99
6/Www	33·53	30·20	16,911½	504·35	1,118·33	679·80	20·28	43·60	4·00
Means	26·32	22·90	15,706·50	596·50	3,385·34	657·01	24·96	140·36	4·18

SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1936.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow — to April.	Per Herd during April.	Per Cow during April.	Per Cow — to April.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A ..	30	23·47	10,979½	365·98	843·14	683·05	22·77	48·58	6·22
9/C ..	16	12·83	5,978½	373·66	827·47	264·41	16·53	36·53	4·42
9/D ..	30	19	10,350	345·00	780·90	547·42	18·25	40·57	5·29
9/E ..	12	11	5,490	457·50	1,003·54	266·56	22·21	47·46	4·85
9/F ..	17	7·57	3,313½	194·91	385·02	146·27	8·60	16·93	4·41
9/I .	27·13	18·10	5,602½	206·50	406·08	253·89	9·36	19·36	4·53
9/L ..	30·43	8·63	2,925½	96·14	166·60	127·31	4·18	7·69	4·35
9/O ..	24	18·93	7,531	313·79	625·35	361·61	15·07	28·99	4·80
9/P ..	42·90	9·87	4,894½	114·09	563·50	234·51	5·47	30·24	4·79
9/W .	26·53	19·43	12,186	459·30	963·16	502·51	18·94	39·52	4·12
9/X ..	13	7·03	1,848	142·15	318·27	105·36	8·10	17·60	5·70
9/Y ..	12.	8·50	4,195½	349·62	670·87	178·44	14·87	26·98	4·25
9/Z ..	12	7·90	2,107	175·58	391·49	124·47	10·37	22·18	5·91
9/Aa .	11	4	1,755	159·54	262·94	84·61	7·69	13·93	4·82
9/Bb .	32	30·43	14,846½	463·94	1,065·65	815·64	25·49	55·43	5·49
9/Ee .	50·10	32·83	9,020	180·04	357·33	466·18	9·30	18·58	5·17
9/Gg .	9·97	8·13	3,566	357·67	692·12	203·84	20·45	39·45	5·72
9/Hh	12	10·17	2,482½	206·88	378·79	130·19	10·85	20·00	5·24
9/Ii ..	37	31·10	7,959	215·10	549·82	428·50	11·58	29·57	5·38
9/Jj .	18	14·93	5,839	324·49	678·30	295·59	16·42	33·04	5·06
0/Kk	17	13	4,410	259·41	456·23	182·26	10·72	19·25	4·13
9/Ll .	11	All	cows	dry					
Means	22·32	14·40	5,785·43	259·19	546·24	291·03	13·04	27·10	5·03

THE DRAUGHT STALLIONS ACT, 1932.

STALLION PARADES TIME TABLE, 1936.

For the purpose of examining draught stallions for a Government Certificate of Soundness and Approval, parades will be held at each of the following centres on the dates and times specified.

Horses submitted for examination must have had such training that the Examining Veterinary Officer may, with safety, handle their legs; further, the legs of every animal should be in a thoroughly clean condition.

Route No. and Date.	Parade.	Time.
Route No. 1.		
Monday, 6th July	Paskeville Railway Station	9·30 a.m.
" "	Thrington Railway Station	11 a.m.
" "	Kainton Post Office	1·45 p.m.
" "	Arthurton, Arthurton Hotel	2·30 p.m.
" "	Ardrossan, Ardrossan Hotel	3·30 p.m.
Tuesday, 7th July	Maitland Show Grounds	9 a.m.
" "	South Kilkerran Post Office	10·45 a.m.
" "	Port Victoria Post Office	11·30 a.m.
" "	Urania Post Office	12·30 p.m.
" "	Wauraltee Post Office	2·30 p.m.
" "	Curramulka Hotel	3·45 p.m.
Wednesday, 8th July	Minlaton Hotel	9 a.m.
" "	Yorketown, York Hotel	11 a.m.
" "	Edithburgh, Trowbridge Hotel	2 p.m.
" "	Stansbury, Jetty Hotel	3·15 p.m.
" "	Port Vincent Hotel	4 p.m.
Thursday, 9th July	Moonta Railway Yards	10 a.m.
" "	Kadina Show Grounds	11 a.m.
" "	Alford Post Office	1 p.m.
" "	Bews Post Office	2 p.m.
" "	Wokurna Post Office	2·45 p.m.
" "	Bute Railway Yards	3·30 p.m.
Friday, 10th July	Ninnes Post Office	9·30 a.m.
" "	Kulpara Post Office	11 a.m.
" "	Port Wakefield, Rising Sun Hotel	12·30 p.m.
" "	Wild Horse Plains Post Office	1·45 p.m.
" "	Dublin Hotel	2·30 p.m.
" "	Lower Light Post Office	3·15 p.m.
" "	Two Wells Railway Station	3 45 p.m.
Route No 2.		
Monday, 6th July	Mallala Railway Station	9·30 a.m.
" "	Calomba Railway Station	10·30 a.m.
" "	Pinery Post Office	11·30 a.m.
" "	Balaklava Sale Yards, Whitwarta Crossing	1·30 p.m.
" "	Whitwarta Post Office	2·30 p.m
" "	Mount Templeton Post Office	3·15 p.m.
Tuesday, 7th July	Snowtown Railway Yards	9 a.m.
" "	Mundoora Railway Yards	11·15 a.m.
" "	Redhill Railway Yards	1·30 p.m.
" "	Merriton Post Office	3·30 p m.
Wednesday, 8th July	Crystal Brook Show Grounds	9 a.m.
" "	Warnertown Railway Station	11·30 a.m.
" "	Gladstone Railway Yards	1·30 p.m.
" "	Georgetown Railway Station	2 15 p.m.
" "	Gulnare Railway Station	3·15 p.m.
" "	Yacka Railway Station	4 p m
" "	Rochester Post Office	4·45 p.m.
Thursday, 9th July	Brinkworth Railway Station	9 a.m.
" "	Hart Post Office	11 a.m.
" "	Blyth Railway Station	2 p m.
" "	Kybunga Railway Station	3·30 p.m.
Friday, 10th July	Hoyleton Railway Station	10 a.m.
" "	Halbury Railway Station	11·15 a.m.
" "	Owen Railway Station	2·30 p.m.
" "	Stockyard Creek Railway Station	3·15 p.m.
" "	Barabba Post Office	4 p.m.
Route No. 3.		
Monday, 13th July	Freeling Railway Station	9 a.m
" "	Fords Railway Station	10·30 a.m.
" "	Kapunda Railway Yards	11·15 a.m.
" "	Hansborough Railway Station	1 p.m.
" "	Tarnma Post Office	2 p.m.
" "	Eudunda Sale Yards	3 p m.
Tuesday, 14th July	Point Pass Railway Station	9 a.m.
" "	Robertstown Sale Yards	9 45 a.m.
" "	Neale's Flat Post Office	11·45 a.m.
" "	Sutherlands Railway Station	1·30 p.m.
" "	Mount Mary Railway Station	2·15 p.m.
" "	Morgan Railway Station	3·15 p.m.
" "	Annadale (Roadside)	4·45 p.m.

STALLION PARADES—*continued.*

Route No. and Date.	Parade.	Time.
Route No. 3—*continued.*		
Wednesday, 15th July	Truro Railway Station	9 a.m.
" "	Stockwell Railway Station	10·30 a.m.
" "	Nuriootpa Railway Station	11·15 a.m.
" "	Angaston Sale Yards (Cole's Bros.)	12·30 p.m.
" "	Tanunda Railway Station	2 p.m.
" "	Rowland's Flat Railway Station	3·15 p.m.
" "	Lyndoch Railway Station	4 p.m.
Thursday, 16th July	Williamstown Hotel	9 a.m.
" "	Springton Hotel	10 a.m.
" "	Eden Valley Hotel	10·30 a.m.
" "	Keyneton Post Office	11·15 a.m.
" "	Sedan Railway Station	12·15 p.m.
" "	Cambrai Railway Station	1·15 p.m.
" "	Black Hill Post Office	2·30 p.m.
" "	Walker's Flat Post Office	3·30 p.m.
Friday, 17th July	Mannum, near punt below Police Station............	9 a.m.
" "	Palmer Post Office	10·30 a.m.
" "	Mount Pleasant Railway Station	11·30 a.m.
" "	Birdwood Railway Station	12·30 p.m.
" "	Mount Torrens Railway Station	2 p.m.
" "	Tweedvale, Rising Sun Hotel	3 p.m.
" "	Gumeracha Hotel	4 p.m.
Monday, 13th July	Adelaide Sales, Wayville	10 a.m.
Tuesday, 14th July	" " "	10 a.m.
Wednesday, 15th July	" " "	10 a.m.
Route No. 4.		
Monday, 20th July	Salisbury Railway Station.........................	9 a.m.
" "	Smithfield Railway Station	10 a.m.
" "	Gawler Show Grounds	11·30 a.m.
" "	Roseworthy Railway Station	1·15 p.m.
" "	Wasleys Railway Station..........................	2 p.m.
" "	Hamley Bridge Railway Station	3 p.m.
" "	Stockport Railway Station	4·15 p.m.
Tuesday, 21st July	Tarlee Railway Station	9 a.m.
" "	Gile's Corner Post Office	11 a.m.
" "	Rhynie Railway Station	12 noon
" "	Riverton Railway Yards	2 p.m.
" "	Saddleworth Railway Yards	3 p.m.
" "	Auburn Railway Station	4·15 p.m.
Wednesday, 22nd July	Watervale Railway Station	9 a.m.
" "	Mintaro Post Office..............................	10·15 a.m.
" "	Kadlunga (Homestead)	11 a.m.
" "	Seven Hills Railway Station	1 p.m.
" "	Clare Railway Station	1·45 p.m.
" "	Hilltown (or Milne) Railway Station	3 p.m.
" "	Andrews Railway Station	4·15 p.m.
Thursday, 23rd July	Spalding Railway Station	9 a.m.
" "	Jamestown Railway Station	11 a.m.
" "	Terowie Railway Station	2·30 p.m.
" "	Whyte-Yarcowie Railway Station	3·30 p.m.
" "	Ulooloo Railway Station	4 p.m.
Friday, 24th July	Hallett Railway Station..........................	9 a.m.
" "	Mount Bryan Railway Station	10 a.m.
" "	Burra Railway Station............................	11 a.m.
" "	Hanson Railway Station	12·30 p.m.
" "	Farrell's Flat Railway Station	1·45 p.m.
" "	Black Springs Post Office	3·15 p.m.
" "	Manoora Railway Station	4·15 p.m.
Route No. 5.		
Monday, 20th July	Caltowie Railway Station	2 p.m.
" "	Mannanarie Post Office	3·30 p.m.
" "	Yongala Railway Station	4·15 p.m.
Tuesday, 21st July	Peterborough Railway Station	9 a.m.
" "	Minvalara Railway Station	10·30 a.m.
" "	Black Rock Railway Station	12 noon
" "	Orroroo Railway Station	2 p.m.
" "	Eurelia Railway Station	3·15 p.m.
" "	Carrieton Railway Station.........................	4·15 p.m.
Wednesday, 22nd July	Moockra Railway Station	9·15 a.m.
" "	Hammond Railway Station	10·15 a.m.
" "	Willowie Post Office	12 noon
" "	Booleroo Centre Railway Station	2·30 p.m.
" "	Melrose Railway Station	3·45 p.m.
" "	Terka Railway Station............................	4·45 p.m.
Thursday, 23rd July	Wilmington Railway Station	9 a.m.
" "	Port Augusta, Beerworth's Hotel, near Railway Station ..	11 a.m.
" "	Stirling North Hotel	12 noon
" "	Baroota Post Office	2 p.m.
" "	Port Germein Hotel	3 p.m.
" "	Bangor Post Office	4 p.m.
Friday, 24th July	Murraytown Hotel	9 a.m.
" "	Wirrabara Railway Station	10·30 a.m.
" "	Yarrowie Hotel	12·30 p.m.
" "	Stone Hut Railway Station........................	2 p.m.
" "	Laura Railway Station	3 p.m.

STALLION PARADES—*continued.*

Route No. and Date.	Parade.	Time.
Route No. 6.		
Monday, 27th July	Woodside Railway Station	10 a.m.
" "	Balhannah Railway Station	11 a.m.
" "	Hahndorf, Union Hotel	12 noon
" "	Mount Barker Railway Station	1 p.m.
" "	Nairne Railway Station	2·15 p.m.
" "	Kanmantoo Post Office	2·45 p.m.
" "	Callington Railway Station	3·30 p.m.
" "	Monarto South Railway Station	4·15 p.m.
Tuesday, 28th July	Murray Bridge Sale Yards	9·30 a.m.
" "	Woodchester Post Office	11·30 a.m.
" "	Langhorne's Creek Post Office	12·15 p.m.
" "	Milang Railway Station	1·15 p.m.
" "	Strathalbyn Railway Station	2·30 p.m.
" "	Macclesfield Hotel	3·45 p.m.
" "	Meadows Hotel	4·30 p.m.
Wednesday, 29th July	Ashbourne Post Office	9·30 a.m.
" "	Currency Creek Railway Station	10·30 a.m.
" "	Goolwa Railway Station	11 a.m.
" "	Port Elliot Railway Station	12 noon
" "	Victor Harbour Railway Station	1 p.m.
" "	Inman Valley Post Office	2·30 p.m.
" "	Yankalilla Show Grounds	3·15 p.m.
Thursday, 30th July	Myponga Post Office	9·30 a.m.
" "	Aldinga Post Office	10·30 a.m.
" "	Willunga Railway Station	11·30 a.m.
" "	McLaren Vale Railway Station	1 p.m.
" "	Noarlunga Railway Station	2 p.m.
" "	Hackham Railway Station	2·30 p.m.
" "	Morphett Vale Railway Station	3 p.m.
" "	Clarendon Post Office	4 p.m.
Route No. 7.		
Monday, 27th July	Kulde Railway Station	11 a.m.
" "	Wynarka Railway Station	11·30 a.m.
" "	Karoonda Railway Station	12 noon
" "	Marama Railway Station	2·30 p.m.
" "	Yurgo Railway Station	3·30 p.m.
Tuesday, 28th July	Berrika Railway Station	9 30 a.m.
" "	Kilpalie Railway Station	10 a.m.
" "	Sandalwood Railway Station	10·30 a.m.
" "	Halidon Railway Station	11 a.m.
" "	Mindarie Railway Station	12 noon
" "	Wanbi Railway Station	12·30 p.m.
" "	Alawoona Railway Station	2 p.m.
" "	Veitch Railway Station	3 p.m.
" "	Pata Railway Station	3·45 p.m.
" "	Loxton Show Grounds	4·15 p.m.
Wednesday, 29th July	Bugle Hut Road, R. T. Green's Farm	9·30 a.m.
" "	A. H. Adam's Farm, Roadside	12 noon
" "	Taplan Railway Station	2 p.m.
" "	Meribah Railway Station	3 p.m.
" "	Paruna Railway Station	3·45 p.m
" "	Malpas Railway Station	4·15 p.m.
Thursday, 30th July	Peebinga Railway Station	11 a.m.
" "	Kringin Railway Station	12 noon
" "	Karte Railway Station	12·45 p.m.
" "	Pinnaroo Show Grounds	2·30 p.m.
Friday, 31st July	Lameroo Railway Station	9 a m.
" "	Wilkawatt Railway Station	10·15 a.m.
" "	Parrakie Railway Station	10·45 a.m.
" "	Geranium Railway Station	11·30 a.m.
" "	Jabuk Railway Station	12 45 p.m.
" "	Peake Railway Station	1·30 p.m.
" "	Buccleuch Railway Station	2 p.m.
" "	Sherlock Railway Station	2 30 p.m.
" "	Moorlands Railway Station	3·15 p.m.
Route No. 8.		
Monday, 3rd August	Waikerie (*via* Blanchetown) Railway Station	12 noon
" "	Devlin's Pound, Roadside	2·30 p.m
" "	Barmera Railway Station	4·15 p.m.
Tuesday, 4th August	Monash Post Office	9 15 a m.
" "	Berri Railway Station	10·45 a.m.
" "	Renmark Railway Station	11·45 a.m.
" "	Paringa Railway Station	2 p.m.
" "	Yamba Railway Station	3 15 p.m.
" "	Taldra Railway Station	4 p.m.
Wednesday, 5th August	Moorook Post Office	9·30 a.m.
" "	Kingston Post Office	10·15 a.m.
" "	Holder Railway Station	12 noon
" "	Nott's Well Post Office	1·30 p.m.
" "	Swan Reach Hotel	3·45 p.m.
Thursday, 6th August	Bakara Post Office	10 a.m.
" "	Mantung Railway Station	12 noon
" "	Maggea Railway Station	1·15 p.m.
" "	Wunkar Railway Station	2·30 p.m.
" "	Tuscan Railway Station	3·15 p.m.
" "	Caliph Railway Station	4 p.m.

STALLION PARADES—*continued.*

Route No. and Date.	Parade.	Time.
Route No. 8—*continued.*		
Friday, 7th August	Goondooloo Railway Station	10·30 a.m.
" "	Bowhill Post Office	11·45 a.m.
" "	Perponda Railway Station	1·30 p.m.
Route No. 9.		
Monday, 3rd August	Tailem Bend Railway Station	10·30 a.m.
" "	Wellington Post Office	11·45 a.m.
" "	Narrung Post Office	2 p.m.
" "	Meningie Hotel	4·15 p.m.
Tuesday, 4th August	Kingston Railway Station	2 p.m.
" "	Reedy Creek Railway Station	3·30 p.m.
Wednesday, 5th August	Robe Hotel	10 a.m.
" "	Beachport Railway Station	12 noon
" "	Millicent Railway Station	3 p.m.
Thursday, 6th August	Hatherleigh Post Office	9·30 a.m.
" "	Rendlesham Railway Station	10·30 a.m.
" "	Tantanoola Railway Station	12·30 p.m.
" "	Glencoe Railway Station	2·30 p.m.
Friday, 7th August	Mount Gambier Show Grounds	9·30 a.m.
" "	Mount Schanck, Roadside	12 noon
" "	Allendale Post Office	2 p.m.
Monday, 10th August	Tarpeena Post Office	10 a.m.
" "	Kalangadoo Railway Station	11 a.m.
" "	Penola Railway Station	1·30 p.m.
" "	Coonawarra Railway Station	2·30 p.m.
" "	Glenroy Railway Station	3·15 p.m.
" "	Struan Railway Station	4 p.m.
Tuesday, 11th August	Naracoorte Show Grounds	9·30 a.m.
" "	Tryon Railway Station	1·15 p.m.
" "	Lucindale Railway Station	2·45 p.m.
Wednesday, 12th August	Hynam Railway Station	9·30 a.m.
" "	Frances Railway Station	12·30 p.m.
" "	Bordertown Show Grounds	3·30 p.m.
Thursday, 13th August	Wolseley Railway Station	10 a.m.
" "	Mundalla Post Office	12·15 p.m.
" "	Kongal Post Office	1·15 p.m.
" "	Keith Railway Station	3 p.m.
Friday, 14th August	Coombe Railway Station	9·30 a.m.
" "	Tintinara Railway Station	10·15 a.m.
" "	Culburra Railway Station	10·45 a.m.
" "	Coonalpyn Railway Station	11·30 a.m.
" "	Ki Ki Railway Station	12·30 p.m.
" "	Yumali Railway Station	1 p.m.
" "	Coomandook Railway Station	1·30 p.m.

PAPERS READ AT CONFERENCES.

CONFERENCE OF DAIRYING BRANCHES, STRATHALBYN, 21st MAY, 1936.

PRODUCING ONLY CHOICE GRADE.

[C. LUND, Strathalbyn.]

During the past few years dairying in this State has made rapid progress; it has passed from the sideline stage to become one of our main primary industries.

Unfortunately, with the increased quantity of butter made, the quality has failed to keep pace, and we find on comparing the export record of the percentage of choice butter made over a period of years that whilst the total quantity exported has shown a steady advance, the quality has fallen to an alarming extent, and this in the face of an enormous expenditure on modern machinery at the various factories throughout the State. Results obtained appear almost as if the introduction of up-to-date plant for the improvement of our butter has defeated its own end, and that instead of improving the quality of the raw material, *i.e.*, cream, so as to turn out at least 90 per cent. choice butter it has allowed the grade to fall back, principally, I think, because it is considered that any sort of cream can be converted to a choice-grade butter by a factory equipped with the latest appliances.

Certainly the factories of to-day can improve the quality of some cream enough to raise it from second to first grade, but choice butter can only be made from sound, fresh cream that has received proper care from the time the milk is drawn from the cow until the cream is made into butter.

[Papers Read at Conferences.]

Reasons for the Decline in Butter Grade.

These are:—(*a*) Competition for cream supply. (*b*) Distance of transport between the place of production and that of manufacture. As we are only concerned with the production of choice cream, we can start right on the farm. There are three main factors that must be taken into consideration; they are as follows:—(1) The cow. (2) Her food. (3) The dairyman. The cow is really the medium by which we convert the food to milk, so she is all-important. She must be healthy or she cannot perform the job of producing healthy milk. Abnormal milk should not be mixed with the bulk milk to be separated, or the whole of the milk will be contaminated. By abnormal I mean:—(1) The milk from freshly-calved cows known as colostrum or beastings. (2) Milk containing any trace of Mammitis. (3) Milk from stale cows that are being infrequently milked when being dried off. (4) The first half pint of milk drawn from all the quarters of each cow. This latter milk is very low in butterfat—usually from 1 per cent. to 2 per cent.—but it contains almost all the bacteria, and is frequently the cause of "off" flavours in the cream. On the other hand the last pint of milk taken from the cow is very rich in fat, sometimes as much as 12 per cent. to 18 per cent., so it pays to strip right out every time instead of leaving a little for the next time. Beastings milk can be detected by its viscous and yellow appearance; it is very high in albumen content and low in fat; the albumen decomposes readily, giving the cream a very cowy flavour. Mammitis milk can be detected by its watery appearance and the presence of strings of curd; this curd can also be seen on the mesh of the strainer.

The Food.

It is impossible to produce a choice cream from inferior pasture, musty chaff, or decayed silage. Most cows will eat food that other animals will refuse, but they cannot perform miracles and turn this waste into choice milk. In my opinion, years of grazing and overstocking, without feeding and renovating the paddocks by spelling and manuring is one of the causes of the decrease in choice grade butter. Where it is necessary to graze or feed strong-smelling food to the cows, do so just after milking, or take the cows off at least three hours before milking time.

The Milker.

Naturally the person milking should be clean. The flanks, tail, and udder of the cow should be clipped occasionally; this applies more especially in winter when the hair is long and mud is plentiful. The teats and udder should be wiped with a clean, damp cloth before starting to milk. The bail, stool, leg rope, and the bucket should all be free from litter, and the milker's hands washed and dried before starting a fresh cow. Dry milking is to be preferred to wet milking, providing of course that the udder has been wiped over to remove the dirt, &c., that always accumulates.

The introduction of the milking machine has helped the industry a great deal where large number of cows are kept, but unless the machines receive constant and thorough cleaning the results are not always satisfactory, and the cream has a strong machine flavour Milk should not be allowed to stand in the shed after it is drawn from the cow; it should be strained through a fine strainer, preferably one with a gauze pad to remove fine particles. This will help the separator by removing a lot of fine dirt which has a tendency to reduce the capacity of the separator.

Separate through a clean separator, and wash the machine every time it is used. When the milk is passed through the separator we divide it into three portions, namely, skim milk, cream, and slime. The slime is held in the separator bowl; it contains most of the contaminating agencies, and if this is allowed to incubate until the separator is used again it will immediately contaminate the next lot of milk, the cream from which will absorb a stale flavour. It is a mistake to separate direct into a vessel containing previously-separated cream, and so on until the can is full. The warm cream coming from the separator should be run over a cooler, or if no cooler is available, the vessel containing the warm cream should be placed in cold water and stirred to remove the animal heat as quickly as possible; this increases the keeping quality, and helps to drive off feed and other volatile flavours. It is also important that all cool cream on hand should be mixed and stirred occasionally. Cream kept too long in a number of vessels exposed to air and light will oxidise. This is sometimes the cause of a tallowy flavour, especially if the cream is rich in butterfat.

Stirring cream induces more even ripening. The lactic bacteria that promote the ripening of cream occur in clusters or groups, but when stirred they are distributed throughout the can and ripening goes on evenly throughout the mass; stirring also liberates the gases that are constantly given off by the chemical action that takes place.

It is a mistake to keep cream too long; if butter is made on the farm the cream is ripe enough when 24 hours old in summer and 48 hours in winter. If sending to the factory it cannot be too fresh, because excess of acid caused by ripening before being received has to be destroyed before it is pasteurised.

A clean, cool dairy is invaluable for storing cream, but it should be used for no other purpose such as a store for general produce, or the cream will absorb any strong flavour. Use only well-tinned cans free from rust. When cream comes into contact with iron for only a short time a metallic flavour results; this flavour becomes fixed and reduces the grade of the butter. A clean, damp muslin cloth placed over the top of the can in summer will reduce the temperature considerably, and it also prevents dust or insects from entering the cream. A can of cream cannot develop any more butterfat with age. Quite a number of dairymen will not send their cream to the factory until it has thickened up in the belief that it will give a higher test. Certainly new cream on the farm will not churn out as much butter as ripe cream, but this is only because the fat particles in the new cream are not in a condition to unite to form butter, with the result that excessive loss of fat occurs in the buttermilk. It is to the interest of all concerned to manufacture butter from the cream as soon as possible.

DEHORNING DAIRY CATTLE.

[J. Y. HUDD, Adelaide.]

Two Years' Intense Study and Practice.

Two years ago I wrote a paper on the theory of dehorning cattle for dairy purposes, having just previously had my herd dehorned. To-day I can write from a wealth of experience and close observation, and have come to the conclusion that "horned cattle" are to-day costing the dairy farmers and stud dairy breeders of South Australia the loss of a colossal sum in the vicinity of a £100,000 per year. My cattle are hand-fed practically all the year, and I am in a position to keep them and their habits under close observation. During the 10 years previous to 1934 I lost an average of one to two cows per year from Mammitis or supposed Mammitis, and it was always the heavy-producing cows, usually a few weeks after calving. During the last two years, having only poley cows, I have not had one case of udder trouble, and my milk production per cow has increased approximately 20 per cent.

In taking particular notice of the habits of dairy cows over a number of years I have proved it an infallible rule that a cow with horns always tries to horn the rear half of another animal, but with dehorned or poley cows it is just the reverse, they invariably butt behind the front leg. If you take particular notice of a cow that is horn marked you will see that it is either on the flank or the escutcheon. It does not need much imagination to realise what must have happened to the protruding, pliable, and soft udder of a heavy-milking cow before those horns tore a strip of hair and skin from the flank or escutcheon, and invariably the trouble which develops in that udder in a few days is blamed to a chill, instead of the bruise.

In my experience 90 per cent. of so-called Mammitis can be put down to this cause. When you realise the delicate nature of a cow's udder it is quite easy to picture the damage that must take place from a blow such as a cow could deliver with her horns. Amongst dehorned cows there is no fear of one another; they feed together contentedly whether in the open or in stalls, and the cow that has been the boss and the fear of other cows becomes the heaviest producer, because she feeds instead of spending her time worrying other cows. They become much more docile and easier to handle, and will drink contentedly together at the water trough and, what is the greatest asset of all, they are not in fear of one another. One should realise what an impediment the udder of a high-producing cow must be to her when she wants to move quickly. If all our dairy cattle were dehorned I can safely say from my observations that 90 per cent. of the udder troubles would disappear, and production would considerably increase, as would the quality of the milk and cream, because there is no gainsaying the fact that there is too much produce from damaged udders coming into the market to-day.

If every dairyman and stud breeder would dehorn every heifer calf at birth, in a few years we would have an ideal type of dairy animal. The cost is about 3d. to do 50 with a caustic potash pencil. Let me conclude by saying I would never again handle or keep horned cattle.

THE MILK EQUALISATION PLAN.

[J. R. Hewland (Secretary of the Dairymen's Association).]

For some years past the number of companies and firms engaging in the wholesale milk business in Adelaide has been increasing out of proportion to the increasing demands. These companies and firms do not buy from the producers on the same or equal terms, which results in some of them being in a more advantageous position for trading than others. For example, the bigger and more important firms undertake to buy the whole of their suppliers' output throughout the year, while others buy only a quota, which varies according to the season of the year, and leave the balance on the farmers' hands. The balance is separated, and the cream sold to a butter factory. The quota of milk purchased by these smaller firms is just about the amount they can resell on the city market as whole or liquid milk. The firms that buy the whole of a farmer's output throughout the year can only market a proportion of it in the city at the higher whole milk price, and the balance they have to manufacture into butter, cheese, condensed milk, or ice cream, whichever is the most profitable. This reduces the market value of the milk they buy to these firms, particularly in the spring when milk is very plentiful. One of the largest of the dairy produce companies, on an average throughout the year, cannot market in the city more than a third of the milk it buys from the farmer—two-thirds of it has to be manufactured.

It would seem that each year the smaller firms have waited until it is known what the biggest buyer is going to pay for milk, and they have then agreed to offer the same price or a trifle more, which means that they are in a very favourable position, especially as several of these firms buy on gallon measurement and not on the basis of the butterfat content of the milk which determines its quality.

For example, if a farmer's milk contains 4 per cent. of butterfat, and the milk is paid for in accordance with its butterfat value, its price would work out as follows:—

Ten gallons of milk equals about 100lbs. weight. This would yield about 4lbs. of butterfat, which at 1s. per pound would be worth 4s., thus the net butterfat value of the milk would be 4.8d. per gallon; but whole, that is, unseparated milk, was, at the time of the hold-up, being sold to retail vendors for 11d. per gallon, and to milk shops for 1s. per gallon. In order that the farmer might receive a share of this higher price received for whole milk, firms buying on a butterfat basis buy at whatever the value of the butterfat in the milk may be, plus a bonus of an agreed amount per pound of butterfat. This works out as follows for 4 per cent. milk, plus a bonus of 3d. per pound butterfat, which was the basis of payment for 12 months ending 31st January, 1936:—Assuming that the average price of butterfat was 11d. per pound, then 10galls. of 4 per cent. milk on fat values would be worth 4.4d. per gallon, to which would be added 1s. as a bonus, thus bringing up the price to 5.6d. per gallon. As before stated, the bigger firms manufacture from 50 per cent. to 70 per cent. of their supplies, but the smaller firms, which buy only such quantities of milk as they can resell in the city at 11d. and 1s. a gallon (until the hold-up), did not pay any more, or in some cases only a trifle more, to the farmer than 5.6d. per gallon. It will be readily seen that these firms must have made money.

An Equalisation Committee representing the three sections of the industry, viz., producers, wholesale distributors, and retailers, has been established. The Committee has appointed a Chairman and a Secretary. Each wholesale trader furnishes the Secretary fortnightly with a return showing how much milk he has bought and how much he has sold during the fortnight. These returns are summarised, and the exact percentage of city sales of whole or liquid milk ascertained. The wholesale price of milk in the city has been fixed for the time being at 1s. 1d. per gallon, and the percentage just referred to is paid for at this price less handling charges, which for the time being have been agreed upon as 4½d. per gallon.

It is really the butterfat in the milk that is purchased, and the price fixed for the butterfat in the portion of the milk which is sold in Adelaide as whole milk is 1s. 8.57d. per pound, and the percentage just referred to would be paid for at that rate less the agreed upon handling charges amounting to 4½d. per gallon. The balance known as surplus milk is bought at current butterfat prices, plus a small bonus of 1d. per pound of fat. For example, if the milk sold in the city as whole or liquid milk tested 4 per cent. butterfat, the net price per gallon, after deducting the handling charge of 4½d. per gallon would be 8½d. This means that if the percentage sold on the city market proved to be 50, then in the case of a producer supplying 20galls. a day he would be paid 8½d. a gallon for 10galls. If butterfat were worth 1s. per pound and the milk were 4 per cent. milk, the 10galls. surplus would be worth, say, 4.8d. per gallon, and to this a bonus of 1d. per pound butterfat would be added. The farmer would then receive the following:—

	s.	d.
10galls. of whole milk at 8½d.	7	1
10galls. equals 4lbs. of butterfat at 4.8d. per gallon	4	0
Bonus on butterfat, 1d. per pound on 4lbs.	0	4
equal to 6.85d. a gallon.	11	5

It will be seen that the price the farmer obtains depends upon the percentage of supplies sold on the market as whole milk, and the quantity and value of the butterfat in his milk.

An important function of the Committee is to equalise among the wholesale traders. If the average percentage of whole milk sales prove to be 50, then all firms that have sold more than that percentage on the city market have to pay into the equalisation fund the difference between the money they had received for the extra quantity they had so sold and that which they would have received had it been sold at butterfat values.

During the 12 months ending 31st January, 1936, the average price the producer received scarcely amounted to 5½d. or 5¾d. per gallon, which is less than it costs

There are some farmers who do not approve of this plan, as it necessitates their selling all their milk to the buyers if they wish to get the full benefits of the plan. These men say that this leaves them without skim milk to use on the farm for the feeding of calves, pigs, and poultry, which are profitable sidelines. Indeed, pigs may be very profitable when properly managed, and it is contended that it is bad for a district to be almost barred from keeping them owing to all the milk being sold to the milk buyer.

The farmers who hold this opinion say that their milk should be bought on a quota system; each buyer would then buy the quantity of milk he wanted for his city trade, and the balance would be separated by the farmer, who would sell the cream and retain the skim milk for use on his farm. It is said that the skim milk is worth a good deal more money used by the farmer than he is paid for it under the equalisation plan, which is certainly true. If then, he were paid for the quota of milk he sold for city use at the same rate as he is paid for it under the equalisation plan, and was able to retain and use his skim milk in such a way as to make it worth to him, say, 2d. a gallon, then he would be better off under the quota plan than under equalisation.

This is the problem which those farmers supplying milk for the city trade have to solve—at present there is a difference of opinion amongst them, but as legislation is likely to be enacted at an early date, it will be necessary to come to a decision quickly.

ADDENDUM.

EQUALISATION OF MILK BASED ON BUTTERFAT CONTENT.

RETURNS TO COMMITTEE BY WHOLESALE BUYERS.

Total fat purchased, 252lbs.
Total fat sold as milk, 126lbs.
Therefore quota would = 50 per cent. on butterfat basis.
City milk price at 20.57d. per lb. fat.
Surplus milk price at 13d. per lb. fat.

Wholesale Buyer X (High-testing Milk).

Producer.	Lbs. Milk.	Test. %	Lbs. Fat.	Quota.	City Milk Price. d.	Surplus Price. d.	Total. d.
A	1,000	4	40	$^{20}{}_{20}$	411	260	671
B	1,000	4.6	46	$^{23}{}_{23}$	473	299	772
C	1,000	5.2	52	$^{26}{}_{26}$	535	338	873
Total purchase .	3,000 Av. test 4.6		138	$^{69}{}_{69}$	1,419	897	2,316

50 per cent. quota on 138lbs. fat = 69lbs. fat at 20.57d. per lb. = 1,419d.

50 per cent. sales on 4 per cent. basis = 69lbs. fat = 166½galls. at 13d. per gall. = 2164d.

Difference between sale and purchase price = 745d.

745d. on 166½galls. = 4.5d. per gall. handling costs.

Wholesale Buyer Y (Low-testing Milk).

Producer.	Lbs. Milk.	Test. %	Lbs. Fat.	Quota.	City Milk Price. d.	Surplus Price. d.	Total. d.
A	1,000	4	40	$^{20}{}_{20}$	411	260	671
B	1,000	3.8	38	$^{19}{}_{19}$	391	247	638
C	1,000	3.6	36	$^{18}{}_{18}$	370	234	604
Total purchase .	3,000 Av. test 3.8		114	$^{57}{}_{57}$	1,172	741	1,913

50 per cent. quota on 114lbs. fat = 57lbs. fat at 20.57d. per lb. = 1,172d.

50 per cent. sales on 4 per cent. basis = 57lbs. fat = 138galls. at 13d. per gall. = 1794d.

50 per cent. sales on 4 per cent. basis = 57lbs. fat = 138galls. at 13d. per gall. = 1

Difference between sale and purchase price = 622d.

622d. on 138galls. = 4.5d. per gall. handling costs.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING MARCH AND APRIL, 1936.

IMPORTS.

Interstate.

	March.	April.
Apples (bushels)	658	436
Bananas (bushels)	16,057	17,322½
Citrus—		
Grape fruit (bushels)	18	11
Lemons (bushel)	—	1
Oranges (bushels)	129	15½
Mixed fruit (bushels)	—	2
Passion fruit (bushels)	64½	276
Peaches (bushels)	16	—
Pears (bushels)	72	25
Pineapples (bushels)	832	1,491
Tomatoes (bushels)	36	213
Nuts—		
Peanuts (bags)	70	110
Peanut kernels (bags)	32	68
Walnuts (bags)	—	4
Ginger (bushels)	2½	2½
Carrots (bags)	10	—
Melons (bag)	1	—
Onions (bags)	135	792
Potatoes (bags)	692	5,553

	March.	April.
Bulbs (packages)	77	73
Cuttings, fruit (package)	1	—
Moss (packages)	—	7
Plants, ornamental (pkgs.)	36	74
Roots, grass (bag)	—	1
Roots, ornamental (pkg.)	1	—
Seeds (packages)	42	49
Shrubs (package)	—	1
Trees, fruit (package)	1	—
Wine casks (No.)	2,633	2,437
Fumigated—		
Wine casks (No.)	33	48
Rejected—		
Bananas (bushels)	36	33
Citrus—		
Oranges (bushels)	1	4½
Peaches (bushel)	1	—
Pineapples (bushels)	3	—
Second-hand cases (No.)	2	2

Overseas.

(State Law.)

	March.	April.
Wine casks (No.)	2,041	1,931
Fumigated—Wine casks (No.)	70	11

Federal Quarantine Act.

	March.		April.	
	Packages.	Lbs.	Packages.	Lbs.
Seeds, &c.	2,399	345,626	2,419	581,772
Canes	134	—	173	—
Chests, cocoanut	165	—	459	—
Chests, tea	1,111	—	2,020	—
Handles	436	—	116	—
		No.		No.
Plants	3	50	2	33
		Sup. ft.		Sup. ft.
Timber	139,467	2,187,460	184,057	5,968,032

EXPORTS.

Federal Commerce Act.

Destination.	Goods.	Packages. Mar.	Packages. April.
Aberdeen	Bulbs	—	1
Aden	Apples	125	335
Antwerp	Apples	—	22,204
Avonmouth	Apples	—	486
Batavia	Apples	75	—
	Vegetables	—	3
Bergen	Apples	300	—
Bombay	Apples	140	455
	Pears	25	—
Colombo	Apples	2,328	3,411
	Grapes	100	—
Copenhagen	Apples	550	450
Dili	Apples	17	17
Glasgow	Apples	15,857	11,357
Gothenburg	Apples	625	200
Hamburg	Apples	18,072	10,100
Helsingborg	Apples	450	—
Helsinki	Apples	3,433	1,850
Hull	Apples	20,667	18,088
Liverpool	Apples	22,428	27,459
London	Apples	75,456	50,839
	Grapes	152	—
	Pears	8,982	16,722
	Plants	1	—
Malmo	Apples	1,300	—
Norrkoping	Apples	450	—
Oslo	Apples	625	325
Penang	Apples	—	5
	Pears	—	3
	Vegetables	5	12

Exports—*continued.*

Destination.	Goods.	Packages. Mar.	Packages. April.
Rotterdam	Apples	21,799	—
Saigon	Apples	50	25
Semarang	Apples	49	201
Singapore	Apples	272	28
	Grapes	10	4
	Peaches	19	—
	Pears	123	124
	Vegetables	77	98
Stockholm	Apples	12,300	—
Surabaya	Apples	25	100
	Grapes	15	—
	Peaches	6	—
	Pears	10	—
	Vegetables	2	—
Turku	Apples	500	350
Valetta	Apples	30	—
Wellington	Seed, clover	148	240

Errata.—February statement—

Hamburg .... Apples, should read—18,719 packages
London ..... Apples, should read—40,050 packages

ADVISORY BOARD OF AGRICULTURE.

At the invitation of the Council of the Urrbrae Agricultural High School, the monthly meeting of the Advisory Board was held on Wednesday, 27th May, at that Institution. Members were welcomed by Mr. H. C. Hogben, M.P. (Chairman of the Council), who, at the close of the meeting, in company with Mr. A. R. Hilton (Headmaster) and other members of the Council, conducted the visitors on an inspection of the class rooms where students were receiving instruction. Students were afterwards seen at their outdoor work and other practical activities, such as carpentry, tin-smithing, saddlery, &c. Present:—Hon. A. L. McEwin (Chairman), Messrs. J. W. Sandford, P. J. Baily, J. B. Murdoch, S. Shepherd, H. N. Wicks, A. J. A. Koch, F. Coleman, R. H. Martin, Professor A. J. Perkins, and H. C. Pritchard (Secretary). Apologies were received from Dr. A. E. V. Richardson, Messrs. W. J. Spafford and A. M. Dawkins.

Life Membership.—Professor A. J. Perkins. The Hon. Minister intimated that he had approved of the Board's recommendation that Professor Perkins be appointed a life member of the Advisory Board of Agriculture.

Ridley Scholarship.—Mr. A. M. Dawkins was re-elected as a representative of the Advisory Board on the Ridley Memorial Scholarship Committee.

New Branch.—Approval was given to the formation of a Women's Branch at Koolunga with 24 foundation members.

Life Members.—Mr. A. F. Crossman (Warcowie) and Mr. H. Schunke (Wirrilla) were approved as life members of the Agricultural Bureau.

New Members.—The following names were added to the rolls of existing Branches:—Belalie Women's—Mrs. E. J. Harbison, Mrs. M. I. Pyne, Mrs. I. M. Garnett; Butler—G. C. Teakle, A. R. Turner; Georgetown Women's—Mrs. Payne; Green Patch—P. Pope; Greenock—M. Cundy; Ironbank—Chas. Coates, Jnr.; Kybybolite—T. Treliving, S. A. Ward; Maltee—Jas. Ferguson, Owen Talbot; Meadows—L. H. Teague; Monarto South Women's—Miss C. Jordan; Mount Bryan—F. M. Jeffries, H. Hooper; Mount Compass—Allan Hall; Murray Bridge—H. A. Follett; Palabie—Walter Miller, John Miller, Stanley Wilkinson, Sylvester North; Pinnaroo Women's—Mrs. P. Gordon; Mrs. O'Connor, Mrs. Wirth; Rosedale—Don Watt, Gordon Pobke; Scott's Bottom—J. Bauerstock, H. Carlaw; Sheoak Log Women's—Mrs. T. C. Kennedy, Mrs. W. Ahrens; Springton—Jas. H. Trenorden, Allan R. Forrest, Fredk. R. Johnstone, Jas. S. Miller; Taragoro—Ben Crabb; Tarlee—Nelson Kelly; Whitwharta—C. Plueckhahn, R. Plueckhahn; Yundi—A. Shiers, A. R. Hill, G. E. Leacroft; Yurgo—Clifford C. Spencer, Lindsay A. Burton; Yurgo Women's—Miss Irene Hopgood; Echunga Women's—Mrs. F. Waters (name omitted from list of foundation members).

New Branch.—Koolunga Women's—Mrs. T. Cameron, Mrs. W. Sykes, Mrs. E. Fuller, Mrs. E. Butterfield, Mrs. A. Buchanan, Mrs. H. Spencer, Mrs. R. Bently, Mrs. S. LePage, Mrs. F. Pedler, Mrs. S. Perrin, Mrs. A. Bentley, Mrs. Burton, Mrs. A. Whitehorn, Mrs. R. Haeusler, Mrs. D. Cooper, Mrs. A. W. Mueller, Mrs. C. Longmire, Mrs. C. Binford, Mrs. M. Brown, Mrs. H. Jones, Mrs. L. Lange, Mrs. E. Spencer, Miss L. Pedler, and Miss M. Pengilly.

Several items were taken in Committee.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO. LIMITED, reported on 1st June, 1936:—

BUTTER.—The recent splendid general rain has altered the whole outlook for the season and dairymen are now jubilant. Fortunately there has been no heavy frosts during the previous dry spell, and although the grasses have wilted somewhat, the rainfall will recuperate the feed besides causing further germination. Production of butter had fallen to about 40 per cent. lower than for the corresponding period last year but from now on the upward trend should be very marked. London values have moved upwards during the last few weeks and at date Australian choicest on spot was selling at 101s. per cwt. In the local markets values have continued steady at:—Choicest creamery fresh butter, in bulk, 1s. 4½d. per lb.; prints and delivery, extra. (This price is for local sale only and, under the Quota System, the equalized price manufacturers will receive will be 1s. 2½d. per lb., on which basis payments to cream suppliers will be calculated.) Separator lines, from 1s. to 1s. 1d. per lb. for choicest; stores, 8d. to 9d. per lb. (These prices are subject to equalization levies.)

CHEESE.—The backwardness of the season in the South-East had its effect on production, and cheese supplies have been short of requirements for a good many weeks past. However, the position will now improve. Western Australian buyers have been purchasing rather heavier quantities than usual and this has shortened the stocks on hand. Values ruling are:—Large and medium, from 9½d. per lb., loaf, from 10d. per lb., at store door, delivery extra; semi-matured and matured, 1s. to 1s. 1d. per lb.

EGGS.—The mild weather just prior to the rain resulted in the supplies of eggs keeping up well. This will probably be checked during the next few weeks but should quantities increase values would tend easier:—Ordinary country eggs, f.a.q., from 1s. per doz. net; selected new laid clean eggs, full-sized, to 1s. 5d. per doz. net.

BACON—A good demand for prime quality, factory cured, breakfast bacon was maintained throughout the month, but hams have continued very slow of sale. Supplies marketed have been sufficient for all requirements and values at present ruling are:—Best quality sides, 10d. per lb.; middles, 10d. to 10½d.; heavy middles, 9d.; rolls, to 8½d.; hams, 11d. to 1s.; cooked, 1s. 2d. to 1s. 2½d. per lb.; lard, bulk, 6d. to 6½d.; prints, 7½d. per lb.

ALMONDS.—Heavy quantities were marketed during April, but prices continued steady with but little fluctuations:—Softshells and Brandis, 8½d. to 9d.; hardshells, 5d. to 5½d.; kernels, 1s. 9½d. to 1s. 10½d. per lb.

HONEY.—Slightly improved turnover occurred during May, but honey is a commodity which is consumed to a greater degree in the cold weather. There are still, however, heavy stocks held by wholesale merchants. Present values are:—Prime quality clear extracted, 2d. to 2½d.; lower grades, 1d. to 2d. per lb.

BEESWAX.—Only light supplies were marketed and much heavier quantities could have been placed at 1s. 2d. to 1s. 2½d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms. A stronger demand set in towards the end of last month and has continued since with prices firmer. This was due to poulterers generally being short of stocks and also some interstate trade influenced the buying. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. 3d. to 4s. 6d.; nice conditioned cockerels, 2s. 8d. to 3s. 1d.; fair conditioned cockerels, 2s. to 2s. 7d.; chickens, lower; heavyweight hens, 2s. 6d. to 3s. 2d.; medium hens, 1s. 8d. to 2s. 3d.; light hens, 1s. 3d. to 1s. 6d.; couple of pens of weedy sorts, lower; prime young Muscovy drakes, 3s. to 3s. 6d.; young Muscovy ducks, 1s. 7d. to 2s. 1d.; ordinary ducks, 1s. to 1s. 9d.; couple of pens of weedy sorts, lower; geese, 2s. 3d. to 3s.; goslings, lower; turkeys, good to prime condition, 8d. to 9½d. per lb. live weight; turkeys, fair condition, 6d. to 7½d. per lb. live weight; turkeys, poor and crooked-breasted, lower; pigeons, 4½d. each.

POTATOES.—New season's, 9s. 6d. per cwt.

ONIONS.—Brown Spanish, 10s. 6d. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of May, 1936, and also the average precipitation for May, and the average annual rainfall.

Station.	May, 1936.	Av'ge. for May.	To end May, 1936.	Av'ge. Annual Rainfall.
Far North and Upper North.				
Oodnadatta	0·20	0·29	1·63	4·62
Marree	0·72	0·58	1·43	5·83
Farina	1·06	0·64	1·87	6·37
Copley	1·14	0·96	2·45	7·85
Beltana	1·09	0·91	3·16	8·47
Blinman	0·73	1·32	2·74	11·81
Hookina	1·32	1·35	4·12	11·18
Hawker	1·58	1·33	3·55	12·2
Wilson	1·11	1·20	4·79	11·77
Gordon	0·74	0·97	2·94	10·46
Quorn	0·81	1·42	3·02	13·15
Port Augusta	0·66	1·09	3·69	9·40
Bruce	0·58	0·92	4·06	9·74
Hammond	0·84	1·02	4·24	11·11
Wilmington	1·64	1·94	6·83	17·28
Willowie	0·82	1·24	3·82	12·22
Melrose	2·22	2·54	7·64	22·85
Booleroo Centre	1·23	1·56	4·09	15·21
Port Germein	0·62	1·51	3·92	12·53
Wirrabara	1·51	2·07	4·31	19·25
Appila	1·55	1·49	4·77	14·62
Cradock	1·32	1·08	3·45	10·78
Carrieton	0·75	1·23	3·76	12·19
Johnburg	1·26	1·09	4·31	10·56
Eurelia	0·90	1·28	4·54	12·76
Orroroo	1·00	1·29	4·74	13·20
Nackara	1·10	1·24	9·83	11·09
Black Rock	0·61	1·26	4·80	12·35
Oodlawirra	1·37	1·13	5·71	11·67
Peterborough	0·72	1·30	4·68	13·22
Yongala	1·03	1·41	5·97	14·43
North-East				
Yunta	0·86	0·94	2·84	8·84
Waukaringa	1·09	0·84	3·23	7·89
Mannahill	0·89	0·78	2·14	8·16
Cockburn	1·72	0·94	3·94	7·91
Broken Hill	1·54	0·93	3·64	9·50
Lower North.				
Port Pirie	0·70	1·56	5·31	13·19
Port Broughton	0·80	1·66	3·21	13·85
Bute	1·20	1·86	5·03	15·39
Laura	1·19	1·85	5·73	17·97
Caltowie	1·64	1·76	5·20	16·76
Jamestown	1·05	1·81	5·19	17·72
Gladstone	1·34	1·69	4·42	16·32
Crystal Brook	0·89	1·77	4·82	15·76
Georgetown	1·58	2·08	5·61	18·29
Narridy	1·33	1·82	3·83	15·77
Redhill	1·33	1·92	6·06	16·54
Spalding	1·30	2·10	4·95	18·74
Gulnare	1·84	2·14	5·60	18·59
Yacka	2·17	1·74	4·92	15·38
Koolunga	1·20	1·68	3·66	15·32
Snowtown	1·24	1·83	5·80	15·70
Lower North—*continued*.				
Brinkworth	1·27	1·84	3·71	15·73
Blyth	1·79	2·03	5·61	16·73
Clare	2·39	2·89	8·34	24·45
Mintaro	2·19	2·71	6·64	23·36
Watervale	2·29	3·08	7·92	26·74
Auburn	2·03	2·76	7·54	23·96
Hoyleton	2·04	1·99	6·07	17·27
Balaklava	1·04	1·82	3·61	15·43
Port Wakefield	0·62	1·56	4·30	12·93
Terowie	0·90	1·21	6·70	13·34
Whyte-Yarcowie	0·73	1·31	7·57	13·58
Hallett	0·94	1·66	5·45	16·41
Mount Bryan	1·18	1·77	6·47	16·77
Kooringa	1·26	1·97	6·04	17·81
Farrell's Flat	1·56	2·09	7·16	18·54
West of Murray Range.				
Manoora	1·83	2·16	5·29	18·94
Saddleworth	1·65	2·22	6·67	19·59
Marrabel	1·71	2·19	6·27	19·96
Riverton	2·28	2·36	6·88	20·79
Tarlee	1·93	2·05	6·02	18·09
Stockport	1·87	1·79	5·91	16·97
Hamley Bridge	1·31	1·74	5·20	16·52
Kapunda	1·49	2·24	6·12	19·76
Freeling	1·92	1·89	4·84	17·79
Greenock	2·37	2·36	6·47	21·47
Truro	1·79	2·13	6·33	19·79
Stockwell	2·32	2·15	6·45	20·04
Nuriootpa	2·13	2·21	7·09	20·68
Angaston	2·31	2·47	7·67	22·32
Tanunda	2·27	2·45	6·69	21·94
Lyndoch	1·72	2·48	4·88	23·27
Williamstown	2·61	3·11	5·89	27·61
Adelaide Plains.				
Owen	1·60	1·66	5·42	14·64
Mallala	1·13	1·92	4·95	16·49
Roseworthy	1·51	1·57	4·35	17·42
Gawler	1·52	2·28	4·91	18·85
Two Wells	1·19	1·86	3·97	15·76
Virginia	1·64	2·06	5·49	17·20
Smithfield	1·45	2·15	4·35	17·65
Salisbury	1·61	2·21	3·74	18·56
Adelaide	2·08	2·73	5·47	21·14
Glen Osmond	2·45	3·22	6·22	25·97
Magill	2·09	3·22	5·35	25·37
Mount Lofty Ranges.				
Teatree Gully	1·87	3·38	5·17	27·07
Stirling West	4·12	5·52	9·93	46·95
Uraidla	2·87	5·38	6·98	43·95
Clarendon	3·16	3·91	7·61	32·79
Happy Val'y Res.	2·68	—	6·39	—
Morphett Vale	2·11	2·67	4·95	22·59
Noarlunga	1·98	2·47	5·60	20·33
Willunga	2·45	3·42	4·68	25·97
Aldinga	1·47	2·46	4·95	20·21

RAINFALL—*continued.*

Station.	May, 1936.	Av'ge. for May,	To end May, 1936.	Av'ge. Annual Rain-fall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	1·77	3·83	5·41	29·42
Inman Valley	1·91	—	5·18	—
Yankalilla	1·23	2·90	3·82	22·76
Mount Compass	2·52	4·31	6·73	—
Mount Pleasant	3·00	2·98	8·63	27·11
Birdwood	2·59	3·18	6·74	29·07
Gumeracha	2·44	3·96	5·89	33·31
Millbrook Res.	2·39	4·55	6·09	34·47
Lobethal	2·57	4·04	6·88	35·91
Woodside	2·36	3·61	6·42	32·15
Hahndorf	2·76	3·91	6·47	34·77
Nairne	2·20	3·10	7·84	28·12
Mount Barker	2·01	3·69	6·98	31·24
Echunga	2·53	4·04	8·19	33·25
Macclesfield	2·23	3·31	8·96	30·34
Meadows	2·75	4·13	8·58	36·02
Strathalbyn	1·69	2·24	7·85	19·32
MURRAY FLATS AND VALLEY.				
Meningie	2·21	2·22	5·96	18·31
Milang	1·28	1·67	5·92	14·89
Langhorne's Ck	1·82	1·57	6·93	14·91
Wellington	2·18	1·56	6·66	14·65
Tailem Bend	2·14	1·74	7·52	15·06
Murray Bridge	2·33	1·41	6·92	13·51
Callington	1·48	1·60	5·73	15·15
Mannum	1·38	1·26	4·95	11·48
Palmer	2·46	1·60	7·05	15·59
Sedan	1·10	1·29	4·11	12·05
Swan Reach	1·07	1·20	4·68	10·65
Blanchetown	1·05	1·23	5·46	11·01
Eudunda	1·90	1·83	6·99	17·15
Point Pass	1·64	2·19	6·81	16·72
Sutherlands	0·67	1·17	5·25	10·81
Morgan	0·93	1·00	3·87	9·16
Waikerie	0·99	0·90	6·20	9·66
Overland Corner	1·24	1·06	5·64	10·25
Loxton	1·09	1·22	4·89	11·50
Berri	0·68	1·13	5·30	10·13
Renmark	0·54	1·05	5·89	10·38
WEST OF SPENCER'S GULF.				
Eucla	0·63	1·26	1·66	10·02
Nullarbor	0·34	1·22	1·09	8·85
Fowler's Bay	2·34	1·69	2·86	11·19
Penong	2·02	1·68	2·94	12·22
Koonibba	1·19	1·38	2·30	12·09
Denial Bay	0·86	1·36	2·11	11·19
Ceduna	1·19	1·35	2·25	10·21
Smoky Bay	0·87	1·36	1·62	10·42
Wirrulla	0·20	1·19	1·36	10·51
Streaky Bay	1·19	1·91	1·75	14·85
Chandada	0·71	1·35	1·17	12·42
Minnipa	0·70	1·51	2·01	13·91
Kyancutta	0·48	1·28	2·04	12·77
Talia	0·83	1·85	1·23	14·76
Port Elliston	1·63	2·08	2·16	16·51
Lock	0·27	1·80	2·68	16·34
Mount Hope	1·60	—	2·29	—
Yeelanna	0·95	2·00	1·82	15·94
Cummins	1·08	2·08	1·83	17·58
Port Lincoln	1·66	2·34	3·59	19·37
Tumby	1·03	1·54	2·23	14·25
Ungarra	0·44	1·90	3·00	16·87
port Neil	0·33	1·37	2·50	13·11
WEST OF SPENCERS GULF—*continued.*				
Arno Bay	0·10	1·34	2·07	12·71
Rudall	0·14	1·59	2·67	12·98
Cleve	0·25	1·75	3·73	14·88
Cowell	0·09	1·17	4·10	11·07
Miltalie	0·23	1·55	3·57	13·70
Mangalo	0·19	1·57	6·21	13·86
Darke's Peak	0·57	1·66	3·46	15·08
Kimba	0·16	1·29	1·53	11·68
YORKE PENINSULA.				
Wallaroo	0·84	1·85	4·19	13·97
Kadina	0·71	1·98	4·09	15·60
Moonta	0·72	1·94	3·28	15·06
Paskeville	0·81	1·89	7·53	15·47
Maitland	1·14	2·55	3·53	19·85
Ardrossan	0·61	1·68	2·73	13·95
Port Victoria	0·71	2·07	2·17	15·41
Curramulka	1·09	2·06	2·98	17·81
Minlaton	1·39	2·16	3·31	17·74
Port Vincent	0·61	1·55	2·66	14·38
Brentwood	0·59	1·88	1·61	15·54
Stansbury	0·64	2·06	2·56	16·81
Warooka	0·96	2·27	2·33	17·44
Yorketown	1·05	2·08	2·28	16·83
Edithburgh	0·91	2·02	2·47	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	2·21	3·18	5·82	24·80
Kingscote	1·45	2·51	3·25	19·16
Penneshaw	1·01	2·07	3·00	19·00
Victor Harbour	2·22	2·54	5·64	21·40
Port Elliot	2·71	2·40	6·56	19·94
Goolwa	1·98	2·17	6·70	17·86
Maggea	1·03	0·92	6·21	10·20
Copeville	1·38	1·21	7·38	11·53
Claypans	1·29	0·99	6·21	10·42
Meribah	1·33	1·36	5·74	11·32
Alawoona	1·75	1·25	5·98	10·40
Caliph	1·25	0·85	5·07	10·98
Mindarie	1·14	1·37	5·34	12·23
Sandalwood	1·44	1·69	6·90	13·64
Karoonda	1·73	1·85	6·04	14·17
Pinnaroo	1·14	1·68	5·90	14·36
Parilla	1·99	1·63	6·09	13·72
Lameroo	2·16	1·82	6·03	15·87
Parrakie	1·57	1·80	5·32	14·56
Geranium	1·53	1·98	5·40	16·36
Peake	2·09	1·86	5·16	15·93
Cooke's Plains	1·58	1·56	6·85	15·28
Coomandook	1·74	2·05	5·60	17·03
Coonalpyn	1·62	1·89	4·88	17·61
Tintinara	2·20	2·23	5·07	18·62
Keith	1·62	2·28	4·81	17·93
Bordertown	1·32	2·05	4·06	19·14
Wolseley	1·31	1·98	3·71	18·47
Frances	1·41	2·16	3·92	20·08
Naracoorte	1·04	2·45	3·53	22·63
Penola	0·99	2·92	3·12	25·96
Lucindale	2·31	2·58	6·68	23·38
Kingston	3·35	3·05	6·48	24·24
Robe	2·18	3·07	5·05	24·64
Beachport	2·40	3·19	5·26	27·06
Millicent	1·98	3·46	6·26	29·83
Kalangadoo	1·77	3·73	5·02	32·20
Mount Gambier	2·00	3·41	5·19	30·87

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

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Alma	*	—	—
Angaston	*	—	—
Appila-Yarrowie	1401	3	7
Arthurton	*	—	—
Ashbourne	*	1 & 29	—
Auburn Women's	1412	—	28
Balaklava	*	27	—
Balhannah	*	—	—
Balhannah Women's	1412	—	—
Balumbah	1402	—	—
Balumbah Women's	1412	1	5
Barmera	*	—	—
Baroota	1401	13	10
Beetaloo Valley	1402	—	3
Beetaloo Valley Women's	1412	—	—
Belalie Women's	1412	14	11
Belvidere	*	—	—
Berri	1403	—	3
Blackheath	1403	9	6
Black Rock	*	—	—
Black Springs	*	7 & 28	—
Blackwood	*	13	10
Block E	*	—	—
Blyth	*	24	28
Booborowie	*	—	3
Booleroo Centre	1401	24	28
Boolgun	*	—	—
Boor's Plains	1402	2	6
Boor's Plains Women's	1412	2	6
Brentwood	*	6	3
Brimpton Lake	*	—	—
Brinkley	*	1	5
Brownlow	1402	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	16	20
Butler	1403	—	—
Calca	*	—	—
Caliph	*	7	4
Carey's Gully	1403	13	10
Chandada	*	—	—
Chapman's Bore	*	6	3
Cherry Gardens	1403	—	—
Chilpuddie Rock	*	—	—
Clare Women's	*	4	1
Clarendon	*	—	3
Collie	*	1	5
Coomandook	1403	31	28
Coonalpyn	*	—	—
Coonalpyn Women's	*	—	—
Coonawarra	*	2	6
Coonawarra Women's	*	16	19
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Cungena	*	2	6
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Devlin's Pound Women's	1412	8	5
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Echunga	1403	8	12
Echunga Women's	1412	1	5
Eurelia	*	11	8
Eurelia Women's	*	1	5
Finniss	*	—	—
Frayville	1403	—	—
Gawler River	*	—	—
Georgetown Women's	1412	14	11
Gladstone	*	3 & 31	—
Gladstone Women's	1412	10	14
Goode	1402	—	—
Goode Women's	*	—	—
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Greenock	*	20	—
Gumeracha	*	6	3
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Hartley	1403	1 & 29	—
Hilltown	*	7	4
Hindmarsh Island	*	—	—
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Hope Forest Women's	1412	—	—
Inman Valley	1403	16	20
Iron Bank	1403	—	—
Jamestown	1402	27	24
Jervois	*	9	13
Kalangadoo	*	11	8
Kalangadoo Women's	*	11	3
Kangarilla Women's	1412	16	20
Kanni	*	—	—
Karte	*	8	5
Karte Women's	*	8	5
Kelly	1402	4	1
Ki Ki	*	—	—
Kilkerran	*	2	3 & 31
Koolunga	*	—	—
Koonunga	1402	—	—
Koppio	1403	8	5
Kulkawirra	*	14	11
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Kybybolite Women's	*	—	—
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Laura Bay Women's	1412	11	—
Lenswood and Forest Range	*	—	—
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Lipson	*	4	1
Lobethal	*	16	20
Lobethal Women's	*	20	17
Lone Gum and Monash	*	16	20
Lone Pine	*	—	3
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Lyndoch	*	—	4
MacGillivray	*	—	4
McLaren Flat	1403	—	—
McLaren Flat Women's	1412	2	6
Maltee	*	2	6
Maltee Women's	*	—	—
Mangalo	*	—	—
Mangalo Women's	1412	8	12
Marama	*	—	—
Meadows	1403	—	—
Milang	*	4	8
Millicent	*	24	28
Millicent Women's	1412	—	—
Miltalie	1403	4	1
Minnipa	*	—	—
Monarto South	1403	—	—
Monarto South Women's	1412	18	15
Moorlands	*	8	5
Moorook	*	—	—
Morchard	1401	3 & 31	—
Morchard Women's	1411	22	26
Mount Barker	1403	20	17
Mount Bryan	1402	—	—
Mount Compass	*	—	6
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Mount Hope	*	28	—
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Mudamuckla Women's	1412	15	19	Shoal Bay	*	28	—
Mundalla	*	—	—	Snowtown	*	10	14
Mundalla Women's	*	2	6	Snowtown Women's	*	2	6
Murray Bridge	*	—	—	South Kilkerran	*	6	3
Murraytown	*	—	—	Springton	1403	1	5
Mypolonga	*	—	—	Stanley Flat	*	20	17
Myponga	*	16	20	Stockport	*	—	—
Myponga Women's	1412	9	6	Strathalbyn	*	8	12
				Strathalbyn Women's	1412	9	9
Nantawarra	1402	2 & 30	—	Sutherlands	1402	2	6
Narridy	1402	—	—				
Narridy Women's	*	—	—	Tantanoola	*	4	1
Narrung	*	—	—	Tantanoola Women's	1412	1	5
Neilshaby	*	—	—	Taplan	*	28	—
Neilshaby Women's	*	—	—	Taplan Women's	*	—	—
Nunjikompita	1402	2 & 30	—	Taragoro	1402	2 & 30	—
Nunkeri	1403	2 & 30	—	Tarlee	*	—	—
				Tatiara	*	—	—
O'Loughlin	1402	18	10	Truro	*	20	17
O'Loughlin Women's	1412	—	—				
Owen	*	13	10	Ungarra	*	—	—
Owen Women's	*	9	11	Upper Wakefield	*	2 & 30	27
Palabie	1402	—	—	Waikerie	*	—	—
Parilla	*	20	18	Wallala	*	11	8
Parilla Women's	*	15	19	Wandearah	1402	7	4
Parilla Well	—	6	3	Warcowie	1401	28	—
Parilla Well Women's	*	28	35	Warcowie Women's	1412	—	—
Parrakie	*	—	—	Warramboo	1402	28	—
Parrakie Women's	*	22	26	Warramboo Women's	1412	—	—
Paruna	—	—	—	Wasleys	1402	2	6
Paskeville	*	28	—	Wasleys Women's	*	2	6
Penola	1401	4	1	Watervale	*	20	17
Penola Women's	1411	—	—	Weavers	1402	13	10
Penwortham	1402	1	5	Wepowie	*	—	3
Petina	*	25	22	Wepowie Women's	1411	—	—
Pinbong	1402	25	22	Whitwarta	1402	20	17
Pinbong Women's	1412	25	22	Wilkawatt Women's	1412	21	18
Pinkawillinnie	*	—	—	Williamstown	*	—	—
Pinnaroo	1412	—	—	Williamstown Women's	*	1	5
Pinnaroo Women's	—	3	7	Willowie	*	27	24
Port Elliot	*	—	—	Wilmington	1401	21	18
Pygery	1403	28	—	Wilmington Women's	1412	9	—
Pygery Women's	*	7	4	Wirrabara	1401	—	—
				Wirrabara Women's	1412	16	20
Ramco	1403	—	3	Wirrilla	*	4	1
Redhill	*	—	—	Wirrilla Women's	*	2	6
Rendelsham	1401	2	6	Wolseley	*	11	10
Rendelsham Women's	1411	—	—	Wudinna	*	—	—
Renmark	*	—	—				
Riverton	*	13	10	Yadnarie	*	28	—
Roberts and Verran	1403	—	—	Yandiah	1401	10	14
Rosedale	1402	—	—	Yandiah Women's	*	10	14
Roseworthy	*	—	—	Yeelanna	*	1 & 29	—
				Younghusband	*	—	—
Saddleworth	*	3 & 31	—	Yundi	1403	—	—
Saddleworth Women's	*	7	4	Yurgo	1403	—	—
Scott's Bottom	*	4	1	Yurgo Women's	1411	—	—

* No report received during the month of May. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from 1st August, 1934, with the following exceptions:—Life members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

MEN'S BRANCHES.

TREE CULTURE.

[Paper read by Mr. R. Hastings at a meeting of the Allandale East Branch on 1st May, 1936.]

This is a subject which has not received as much attention as it should have done. This has perhaps been caused by use of superphosphate, making it possible to carry more stock. A tendency for greater subdivision of holdings has resulted, leaving some paddocks devoid of any form of shelter or shade. The value and importance of trees on the farm can hardly be stressed enough. Horses and cattle have more chance of getting away from bot and other flies, if there is a plantation where they can shelter. The appearance of plantations of trees on a holding makes it much more valuable. Trees planted on poor land increase its value both by checking drift and by producing something of value, whereas before, its production was practically nil. If only for use of ewes at lambing time the planting of some trees or shrubs is well worth while. Before the actual planting of the trees the site for the plantation should be prepared and securely fenced. The erection of the fence should receive special attention, as all one's labour will probably be in vain if stock are allowed to break through. If the land upon which the plantation is to be grown is infested with rabbits it would be wise to erect netting. About a fortnight before the trees are planted it is advisable to dig the ground to a spade's depth and leave a small hole in the centre. The next thing to consider is the best type of tree to plant. Several proved types of trees in the district are suitable for plantations, namely, pines, cypress, Yate gums, tree-lucerne, some types of ornamental gums, black and Cootamundra wattles, and others.

The pine tree of the *Insignis* type is the most common and is a better type than the Aleppo. These trees are comparatively quick growing; trees planted on the south side of the Memorial Park about seven years ago are now about 12ft. high. These trees when fairly well grown can have the branches or limbs cut, and a good deal of wood is thus provided. An evidence of this was recently provided when Mr. Charles Winterfield lopped his pine limbs and cut them into firewood lengths. Pine trees can also be made into a hedge if required.

Cypress is perhaps more adaptable for hedge growing than for growing as individual trees. These trees start slowly, but later make rapid growth.

In times such as the present, when firewood is becoming scarce, the establishment of a plantation of Yate gums would be an economical proposition, as these trees can be lopped back every few years without doing them harm.

Tree lucerne is an ornamental flowering tree which grows quickly, with a graceful foliage and a mass of flowers in the spring. It makes a good break or shelter but is not a long-living tree. Tree lucerne provides good food for bees, and can be fed to cattle in time of drought.

The growing of ornamental gums is both pleasing to the eye and adds greatly to the appearance of a holding, besides providing useful shade and shelter.

The growing of wattles for a temporary plantation is commendable, as the bark from these trees is commercially valuable after they have served their period of usefulness as shade trees.

Among the native trees the Sheoak is worthy of mention as it has proved a great standby in times of drought, and when young is perhaps the finest shade tree procurable.

It must be remembered when planting trees of any description that they are robbers of soil, and therefore one cannot expect to grow anything close to them. Pick the place and plant them for shade and shelter as well as to beautify the homestead.

TREE PLANTING.

At a meeting of the Pygery Branch held on 5th May there was a good discussion on planting trees for wind breaks and shelter. Members considered that it would be too costly to grow many trees in the Pygery district, as they required constant watering and attention, and few trees other than native species were suitable. The only tree that was not destroyed by stock biting the bark was the native pine. It was more satisfactory to reserve clumps of native pine, black oak, titree and mallee than to plant trees which would not thrive. Trees or shrubs planted for hedges should be well spaced, otherwise they would die during dry spells. It was advisable to plant a few trees each year, provided they were well cared for.

FORESTRY ON THE FARM.

Paper read by Mr. A. T. Cowley at a meeting of the Roberts and Verran Branch on 13th May.—Forestry and farming, as generally understood, have apparently little in common, and indeed seem directly opposed to one another. The most that the average farmer knows about forestry is expressed in a desire to destroy the forest that he may farm upon the one-time forest land, while the forester in turn may regard the farmer as a natural enemy—or perhaps he would rather say an "unnatural" enemy—for his ideas of farming would probably be that it was an industry suited to the plain country, and not to wooded lands.

There may be room for differences of opinion as to whether wooded areas should ever have been cleared for farming. It is a grave mistake on the part of the settler clearing a new scrub block to clear every acre bare of natural timber, whatever kind it may be. Uusually the site selected for a homestead and farm buildings carries some of the best timber on the place. A fair sized patch of this can be left for ornamentation and shelter around the house, farm buildings, and stock yards, allowing room for clearing a large enough space around each for moving about with stock and plant, and around the house particularly, for a garden.

Some argument against this practice may be advanced on the grounds of the danger of fire, and of scrub around, or near the buildings, helping to spread it from one to the other in the case of an outbreak. However, if all dead wood is cleared up for household firewood, and leaves, bark, and inflammable undergrowth, if thick enough to carry a fire, are raked away from around the trees and burned up in the winter or early spring, the timbered belt around the homestead becomes a protection rather than a menace, for a fire will not travel through it. An important thing to remember when laying out the homestead, etc., is that if the natural timber does not offer sufficient protection, suitable trees should be planted in desired positions during the first winter, or as early as possible, otherwise a bleak and windswept patch of barrenness around the homestead may result.

Odd large trees or small clumps of scrub trees should be left in suitable places for the purpose of providing shelter for stock from summer sun and winter winds, and strips for breakwinds in country that is likely to become windswept, or to drift. Where the native timber is unsuitable for the required purpose, trees of a better class suitable to the locality should be planted, and protected from damage by stock or vermin until large and strong enough to stand exposure, and serve the purpose for which they are intended.

Probably only in exceptional cases would it pay a farmer to attempt to plant and grow his own timber for use on the farm, but a "reserve" of a few acres of straight-limbed mallee, or of ti-tree, sheoak, or pine where these exist, enables one to cut out a few rails or posts, or pieces for many purposes for which "round timber" will serve as well as "sawn", and to save a good deal of expense involved where every stick of timber required around the farm has to be purchased, and often much time lost while it is being procured.

In addition to beautification of the homestead and of the farm generally, shelter for human occupants and for stock, and protection of the land from damaging winds, there is the question of protection and shelter for our bird friends to be considered. That large trees around the homestead harbour birds of vermin types must be admitted, but in consideration of the destruction of many species of useful birds which live and nest upon the ground, by foxes, the fact must be faced that a treeless farm will rapidly become a birdless farm. We are becoming more dependent upon the tree-inhabiting birds to do the useful work of insect destruction upon cultivated crops and pastures, and will eventually realise that shelter for our useful birds must be retained or provided.

With whatever kind of timber a farm may be surrounded, it will be a good rule never to destroy a tree until something better can be put in its place. It may be a crop, a building, a roadway, some other essential—or a better tree. The one item which the average farmer is apt to overlook is the better tree.

THE RISE IN THE SHEEP INDUSTRY.

The above was the subject of a paper read by Mr. E. G. McDougall at a meeting up the Upper Wakefield Branch on 5th April.

Origin of Sheep.—The sheep of by-gone ages, said Mr. McDougall, had not the thick, useful wool it bears to-day. Time and the efforts of man had altered it to an amazing degree. People of the earliest civilisations—races of desert nomads which occupied Mediterranean countries long before 10,000 B.C. tended flocks of sheep and goats, moving to fresh pastures as grass became scarce. After thousands of years the art of writing developed, and from the ancient written records of such people it was learned that they were not without sheep. Records unearthed from burial chambers revealed that sheep had an existence in ancient Egypt thousands of years before the birth of Christ. The Egyptians were skilful weavers. Samples of material taken from mummies and examined under a microscope showed that the fineness of the weave surpassed the best workmanship of to-day. However, they had not learned to make cloth from wool, which seemed to indicate that sheep had not acquired wool as it was known at present. Sheep were mentioned throughout Biblical history, but there was no description of their appearance.

Bakewell.—In England until the eighteenth century no effort was made to improve the carcase of the sheep. Sheep were kept chiefly for wool, and their appearance was anything but up to show standard. The old Leicester sheep resembled something between a sheep and a goat. Then came Robert Bakewell. Bakewell had travelled much, and everywhere he had seen the same poor specimens of sheep. With great patience and care in scientific cross-breeding Bakewell produced a new Leicester, a sheep which made good meat, fattened early, and weighed heavily. Improvements in industry, especially in the cotton industry, were a stimulus to improvement in the wheat and sheep industries. As a result of the industrial revolution the population increased and with it the demand for foodstuffs. There also came into being the Smithfield Club where farmers met and discussed scientific breeding and agricultural improvements generally. Owing to the good work done by the Smithfield Club and to the efforts of Bakewell, by the year 1800 sheep had increased in weight threefold.

Sheep in Australia.—When the first shipment of convicts arrived at Port Jackson in January, 1778, under Captain Arthur Philip, the first Governor of New South Wales, Philip brought with him 44 sheep from the Cape Colony. By September of the same year all but one sheep had died, either from eating rank grass or by the attacks of dingoes. In 1793 30 Bengal sheep arrived from Calcutta and a few English sheep from Ireland. The Indian sheep were a poor type, with a covering resembling hair rather than wool. By cross-breeding with the English sheep their progeny were noticeably improved both in frame and wool. The idea then occurred to a certain Captain John MacArthur that if a better type could be imported, wool of a better class might be produced.

MacArthur.—MacArthur is honoured to-day as the father of the Australian wool-growing industry and the founder of Australia's material prosperity. He threw himself with great vigour into the business of farming, but soon came to the conclusion that pastoral pursuits were more suitable to the country, and began to make his experiments in sheep breeding.

MacArthur purchased 3 rams and 5 ewes from a man who had been to the Cape of Good Hope for supplies and who brought back 26 Merinos. He also obtained 5 rams and 1 ewe from the flock of King George III. at Kew. The Merinos, crossed with the Indian sheep already mentioned, formed the beginning of MacArthur's flock. Other breeders, such as William Cox and the Reverend Marsden built up large flocks, but whereas they were anxious to obtain large carcasses, MacArthur strove to secure better wool. In the beginning mutton was more profitable, but eventually wool became the more important.

He submitted samples of his wool to manufacturers in England, who pronounced it as fine a wool as the best Saxon variety. On the recommendations of the Secretary of State and the Privy Council, orders were sent to the Governor of New South Wales to grant MacArthur 5,000 acres of land on which to carry on his good work.

Following the good example set by MacArthur, attention was given to breeding, and the all-round improvement of the sheep. For a time the idea prevailed that a longer wool of coarse fibre would be best, and it brought about a complete change. However, it was soon realised that a mistake had been made and steps were taken to remedy it.

In about 1860 a craze occurred for wrinkly Merinos. Since 1910 however another change has taken place. It was found that wool from the wrinkly variety was not of such even quality. Plain-bodied sheep with larger frames displaced the wrinkly variety, and at the present time the best Merinos were plain-bodied, well clothed with wool of long staple and good quality.

Discovery of Grasslands.—As long as the sheep industry was confined to the coast it could not prosper. The climate was too wet, causing footrot and water-in-the-head. An important step towards the progress of the industry was when MacArthur moved his sheep from Rose Hill (now known as Parramatta) to Camden. Then in 1813 Gregory Blaxland crossed what had formerly been regarded as an impregnable barrier, the Blue Mountains, and the rich grasslands, with the more suitable climate, were discovered.

Pastoral Age.—The years 1830-1850 had often been referred to as the "Pastoral Age." In the days prior to the gold rush wool was king. A population of less than half a million had 16,000,000 sheep, while so little wheat was grown that flour had to be imported. After the gold rush period, about 1860, the sheep industry underwent vast changes. Population had increased, prices had risen, and in many industries, for a time at least, labour was scarce and costly. Open runs with uncertain boundaries gave place to fenced runs with dams and artesian bores. The country could then safely carry larger numbers; the wool became sounder and the fleece, as a whole, of better quality. Stock was improved; and the advent of the railway made transport cheaper and quicker.

The Boom.—From 1870 to 1884 was a boom period, followed by a decline. Wool prices fell, land values were high, and the rabbit pest became serious. Sheep owners soon began to realise that they must somehow cut costs. Shearers' rates were reduced from £1 per hundred to 17s. 6d. per hundred. The immediate result was the formation of the Shearers' Union, and bad feeling developed between employers and employees. Then Mr. Frederick Wolseley invented the sheep shearing machine, and thus brought about a saving in labour. The idea was said to have come to Wolseley as he sat in a dentist's chair, looking gloomily at the drill which would soon be at work in his mouth.

Size of Flocks.—To-day most sheep were in districts between the 10in. and 25in. isohyets, and very few were in districts above the 75° isotherm. Some were raised where the rainfall was less than 10in. In the central districts of Australia saltbush and bluebush formed suitable fodders. The water problem was overcome to a large extent by means of artesian bores. The largest flocks were on the Darling Downs and the Riverina in New South Wales, and even in South Australia. In early years the flocks were, of course, very small, but in 1891 there were 73 owners with over 100,000 sheep; by 1901 the number had been reduced to 12. At the present time there was one large station in the Riverina with over 150,000 sheep, but generally, flocks were on a much smaller scale than formerly.

The following table shows how the industry has developed:—

1807—MacArthur sent 245lbs. wool to England.
1821—Export of wool amounted to 172,880lbs.
1841—Increased to 9,000,000lbs.
Present exports of wool over 500,000,000lbs., valued at nearly £60,000,000.

Wool had played such an important part in the development of the country and brought in so large an income that Australia had been called "The Land of the Golden Fleece." She was the largest wool producer in the world, producing about 17 per cent. of the world's total, and had an average of 100,000,000 sheep. Only 5 per cent. of the wool produced was utilised in Australian factories.

HINTS ON FENCING.

[Paper read by Mr. S. G. Chynoweth, at a meeting of Boor's Plains Branch on 7th May, 1936.]

In days when fencing timber was plentiful posts were usually placed about 10ft. apart, and experience has shown that the most efficient fences are those with panels of that width. However, the increasing scarcity of suitable timber, together with much higher labour costs have in recent years compelled landholders to exercise greater economy in the use of posts, and the panels are now of much greater width; in extreme cases posts are as much as 1 chain apart. In erecting a fence, however, efficiency must be taken into consideration as well as cost, and it is very bad economy to endeavour to save a little on the original cost by reducing the number of posts if the result means higher cost of maintenance or a fence that will not give the desired protection. The loss consequent upon several valuable horses or other stock breaking through a weak fence on to ripe wheat for instance, may be much greater than the saving effected in the erection of the fence. The limit to the width of panels is still a subject of controversy. It is practically agreed, however, that 22ft. is a very suitable width, and unless posts are very expensive, that is the panel which should be adopted. When wide panels are used, it is essential to use droppers. A number of different types of droppers have been placed on the market; the wooden dropper as used by the railways seems to be very efficient, as their fences are models of efficiency.

TIMBER FOR POSTS.

While certain kinds of timbers are undoubtedly the best for fencing, choice is limited by the kinds available in the vicinity of the area to be fenced. The chief points to be considered are strength and resistance to decay, to attacks of white ants and also fire—that is where the concrete post is most valuable. Size is also an important consideration, though this depends on the kind of timber used, and upon the age of the trees from which the posts are cut. As a rule, small trees are sappy, and decay quickly. Suitable sizes for various posts are:—Ordinary, 6ft. 6in. long, 6in. to 8in. in diameter; corner posts, 8ft. 3in. long, 12in. in diameter; straining posts, 7ft. 9in. long, 10in. in diameter; gate posts, 9ft. long, 12in. in diameter. Gate posts should be let in ground 4ft., strainers 3ft., corner posts 3ft. 6in. A quite common defect in the construction of a wire fence is that of placing the strut too near the top of the post, and consequently at too great an angle with the line of fence. The result is that when the wires are strained, the post is pulled out of the ground. In order to prevent this, the strut should be about 22in. from top of post, and not lower than half-way. It is a good plan to put in a post about 6ft. from strainers and strut strainer against this. A strut too short is a failure. It must be a reasonable length.

BARBED WIRE.

The use of barbed wire very largely increases the efficiency of any fence to which it is attached. Objections are sometimes raised to it on account of the injuries occasionally caused by stock, but these injuries are in most cases brought about by misuse. For boundary or ordinary subdivision fences it is very useful, and the likelihood of stock being injured is very remote provided it is kept reasonably well strained. Barbed wire should never be used in yard fences or in fences where horses congregate, such as near stables, as in the fighting and playing which goes on amongst them, there is great danger of the animals being badly torn. Barbed wire is most dangerous when it is allowed to lie around loose, or is allowed to become very slack in the fences. It cannot be condemned, however, merely because a few people are careless in its use.

RAIL FENCES.

Whilst it has been superseded by the wire fence for boundaries and general subdivision work, for some purposes, such as yards, approaches to gates, bridges, &c., the rail fence is still required. Such fences are more easily seen than wire fences, and their appearance indicates that they are a more effective barrier than even barbed wire. Some details regarding them and their construction are therefore likely to be of interest.

Three-rail Fence.—The posts are mortised as follows:—First rail 6in. from top of post, second rail 21in., third 36in.

Two-rail Fence.—Top rail 6in., second 28in.; one or two wires between rails is very effective.

Single-rail Fence.—Top rail 6in. All measurements for mortises being taken from the top of posts.

ERECTING WIRE FENCES.

In putting up a wire fence, supposing the timber is already laid on the ground, the first thing to do is to dig the post holes; and even in connection with such an apparently simple operation as that, a few things are worth remembering. The holes should be from 22in. to 24in. in depth. They should not be made too big, as this involves unnecessary labour both in digging, filling and ramming; besides, the post will not have such a firm grip in the ground. They should be a little more than large enough to receive the post comfortably and leave room for the rammer to work to the bottom of the hole. Dig the full depth straight away. If a little too deep, it is easy to put in some loose earth to make the post the required height. Sight the posts from the centre, and fill in and ram the bottom first 6in. thoroughly. The bottom and near it is the place where ramming is most required; as the top is approached less ramming will do. Place the earth that remains neatly around the post to allow for subsidence. The tools required for post hole sinking are a medium size iron bar with rammer head and chisel point, and a long-handled shovel. This tool should have a round nose and be bent inwards at the sides, so as to form a kind of scoop. Small post holes cannot be dug with wide shovels. Sink post holes if possible when the ground is in good condition, not too wet and not too dry. When boring for wires, bore straight and right through, so as to push out anything that may impede easy threading of the wire. An easy and simple way of running and threading wire through posts is to place the coil on a reel made on the capstan principle; this allows the wire to run off freely and prevents it getting entangled. The wire is then pulled through the posts from one strainer to another, and strained up tight. Strainer posts are the mainstay of a wire fence, and should be of the best timber procurable. Those used at angles should be mortised to receive stays or struts. All posts should have the bark taken off before being put into the ground. No fence is complete without a gate. All gate posts should be separate from the fence posts.

In ordinary wire fences the wires should be placed as follows, measured from the ground:—6in., 12in., 18in., 25in., 34in., 46in., with barb on top. This is for a 4ft. 6in. high fence. For a 3ft. 10in. fence, 6 wires only are needed. It is a good plan when fencing to use a wire standard attached to the ordinary wooden or cement post to run wires through, as it saves a lot of boring, and if the post gets burnt or decays, it will not interfere with wires.

Gate posts should be 9ft. long, placed 4ft. in the ground, and be about 12in. in diameter. Leave gate post above all ordinary posts adjoining gate, as they look better and set gates off to a better advantage. It shows neatness if all posts are sawn off level on the tops.

THE VALUE OF PEAS ON THE FARM.

[Paper read by Mr. E. L. Orchard (District Agricultural Instructor) at a meeting of the Jamestown Branch on 18th May, 1936.]

The cultivation of peas as a farm crop dates back to prehistoric times, there being no lack of evidence that they were utilised as such by the ruling nations of ancient days, and the original parent of the varieties grown to-day still flourishes in a wild state in the Levant. There appears to be every reason to believe that the pea is a native of Southern Europe and the North Coast of Africa. From there it has spread to all parts of the world where climate and soils are favourable, and due to its proven utility has established its worth in the routine cropping of our cultivated lands.

VARIETIES.

After allowing for the claims of some authorities, that all kinds of peas usually found in cropping systems to-day are members of the one species, they are more generally separated into those of Field Peas (*Pisum arvense*) and Garden Peas (*Pisum sativum*), and of these there are two varieties of Field Peas of main importance in South Australia, viz., Early Dun and White Brunswick. The former, on account of the bulky nature of its growth, is more suited for the wetter districts. It is a good cropper, and holds its seeds well after they are ripe, the variety deriving its name from the fact that the greenish-grey at ripening changes to dun colour. Over the lighter rainfall areas of the north, the White Brunswick Pea is giving good returns, though producing a lighter growth for grazing. They are earlier than the Dun, and so often escape the hot winds of early summer, the same earliness often proving their salvation from the attacks of grubs.

THEIR PLACE IN CROPPING SYSTEM.

Attention has been focussed on the crop during recent years because of its value in rotation with wheat, for in all successful systems of rational cropping where bare fallow is not practised, or only availed of occasionally, a leguminous crop is all-important to invigorate the land and add to its store of nitrogen. Up to the present the only legumes we have been able to crop with any degree of economic success in our recognised wheatgrowing districts are Field Peas, and even these are limited for certainty to those localities where the rainfall is not below 17in.

FOR AND AGAINST.

Bearing this in mind, it will be as well just here, to examine the disadvantages along with the advantages accruing from the growing of peas as a regular farm crop. They will not withstand extremes of weather as other cereals do, thriving best under cool moist conditions, and though they can be grown successfully for grazing where the climate is less congenial, suitable weather is essential to ripen grain. The early growth is hardy and not readily affected by frost, whilst relatively warm dry weather does not check them, even although they do not possess the deep-rooting habit of some cereals. At the same time they are very sensitive to really hot weather, and if subject to hot winds during the later growing period soon wilt beyond recovery. Rough weather or frosts when the crop is in flower work the greatest havoc as far as the setting of grain is concerned; however, this disability applies to some extent with all field crops. Harvesting the pea crop presented a difficulty until within recent years, and definitely limited the extension of the area sown; but with the invention and construction of pea harvesting attachments to the regular wheat reaping equipment on the farm, this has been rendered comparatively easy, and a far less costly job, thus permitting of the profitable growth of the crop over a much larger portion of the State, where previously it could not be undertaken. Lastly, one must not overlook the fact that swarms of caterpillars are at times very troublesome. They not only damage the grain crop directly by devouring it but also by their breaking of the pea hulls leading to a greater percentage of split peas in the sample. Undeterred by such discouraging experiences, however, there are many substantial advantages to be secured by the judicious cropping of peas on most farms situated about our surer rainfall lands. As a fodder crop to supplement the natural pastures, there is no crop that is more valuable for stock. Cows and pigs do exceptionally well on it, the feeding worth of a field of peas having been demonstrated over and over again with lambs, dairy cattle, and pigs. No other annual crop will provide such excellent cheap feed at a time when the natural pastures have given out, thus enabling the farmer to market his stock at good prices, rather than dispose of them at low rates as ''stores''. Held back till the grain has ripened, and then grazed is the most satisfactory method of harvesting with livestock, and could be adopted to the great advantage of many more of the mixed farming properties of the middle and upper north. Peas have a relatively short-growing period, but during that time they build up the reserves of nitrogen in the soil, through the action of the bacteria housed in the nodules on the roots of the plant. Hence the reference to peas as a renovating crop, and the determining factor of their position in a rotation, preceding the main cereal, wheat. Investigational work over a period of twenty odd years under peas, has shown the gain of nitrogen per acre to be equal to an annual dressing of at least 2cwts. of nitrate of soda, whilst for restoring organic matter to the light sandy soils of some districts, either through the agency of green manuring, or the droppings of grazed stock, they are invaluable.

SOILS.

Climatic conditions, rather than soils, may be considered of more importance for the successful propagation of peas, the crop doing well in most soils of normal fertility, provided they are well supplied with lime, as peas remove five or six times as much lime from the soil as do the cereals. The texture of the soil, too, has little influence, though it is only natural to expect the best results from well-balanced loams. On rich flats, and soils of volcanic origin, there is a tendency to bulky growth at the expense of the grain yield.

PREPARATION OF LAND AND SOWING.

As peas do not assist in cleaning the land of weeds, thorough preparation of the soil to be sown, with a view to the destruction of weeds, is advisable. Assuming the crop is to be sown on a wheat stubble, early breaking of the land, followed by a harrowing, is necessary to encourage the germination of weeds with the opening rains, when in average seasons a subsequent cultivation should leave the soil in a clean state for the drilling of the peas. Sowing should take place not later than mid-June, in a seedbed of fine tilth, up to a depth of 2in. in the stiffer types of soil, using not less than 60lbs. of seed, with an increase in quantity even up to 2bush. per acre if it is intended to utilise the crop as green manure, or for purposes other than grain production. The lime requirements having been met by the nature of the soil, superphosphate is applied along with the seed at the rate of 90lbs. to 1cwt. per acre or more, according to the proposed destination of the crop. Leaving the drilled field with a rolled surface will facilitate harvesting by reducing damage and wear and tear of the machinery to a minimum, especially on those paddocks whose soil is largely of a gravelly formation.

UTILISING THE CROP.

All of the pea plant is of value as fodder except the roots, and these perform an extremely valuable function in assisting to improve the soil fertility. Peas may be fed to stock as green forage, or in the form of silage or hay. The grain is the most nutritious of all farm seeds, and pea straw is almost equal in value to good oaten hay. The feeding of peas rarely upsets the digestive organs of the animal, though if fed in large amounts to horses there is a remote danger of flatulent colic or even constipation, but on the whole peas are a very safe crop to feed. Pea hay varies in composition according to the stage at which the crop was mown, and generally should be cut for hay when the first pods are full grown but not filled. The effect of rain on pea hay is to dissolve out the soluble carbohydrates, thus reducing its feeding value. Pea silage or mixed peas and oats or wheat make an excellent combination for ensiling. Silage from such a source is very palatable to dairy cattle, being much richer in milk-producing nutrients than that made from cereals. The crushed grain may be fed as a concentrate in conjunction with bran, milkers producing well on a ration of which peas form about one-third of the daily allowance. Pigs are particularly responsive when fed peas, their digestive tract being well adapted to this grain, less than 1 per cent. being found undigested in the excreta. Peas increase the proportion of lean meat, impart a sweet flavour to the bacon, and make for firm and white fat. Good store lambs will gain from 8lbs. to 10lbs. a month, it taking 3lbs. to 4lbs. of peas to give an increase of 1lb., and actually it has been found that a 20bush. crop will fatten about 10 lambs to the acre and produce about 250lbs. of increase. Given plenty of water, stock fattening on peas require very little attention, and the quality of the meat from pea-fed lambs commends it as being sweet and tender, firm in fat and free from rank flavours.

ORGANIC MATTER IN RELATION TO AGRICULTURE.

[Address delivered by R. I. Herriot, B. Ag. Sc., at a meeting of the Balaklava Branch of the Agricultural Bureau on 27th April, 1936.]

The original source of soil organic matter is plant material. The plant whilst living is fed by two agencies—firstly, the soil solution from which it gains the necessary supplies of mineral matter and water; and, secondly, the air which provides carbon dioxide. The carbon dioxide and water later combine, through the agency of sunlight and the green colouring matter in the leaves, to form starch and the woody tissues of the plant. This latter we refer to as organic matter.

If the plant remains uneaten by stock it will eventually either come to lie upon the surface of the ground, and under marshy conditions form peat, or become mixed with the soil, and as a result of bacterial activity form humus. It will be seen, therefore, that the dead plant returns more to the soil that the living plant takes away, and there is no loss in mineral matter whatsoever.

If, on the other hand, the plant is eaten by stock a certain amount of both the mineral constituents and organic matter is absorbed by the animal. The remainder is returned to the soil in the form of urine or faeces. For a growing animal it is estimated that 90 per cent. of the mineral matter and 50 per cent. of the organic matter returns to the soil in this way. Hence, although under grazing, a proportion of each is lost to the soil, the gain in organic matter is still quite appreciable, whilst the loss of mineral matter is relatively small.

Soils which contain organic matter contain a source of energy, and therefore soon become the abode of numerous micro-organisms. These feed upon the organic matter and destroy it, bringing about such processes as nitrogen fixation and nitrification, both of which result in the formation of nitrates. Hence it can be seen that two opposite processes are at work—one tending to bring about an increase, and the other a decrease in the amount of humus present in the soil.

It is of fundamental importance to agricultural lands that there should be at least a balance between the two processes, and that there should always be a reserve of organic matter in the soil. Observation shows that humus has a number of very important effects upon any given soil:—

1. It gives the characteristic dark brown or black colour to fertile soils.
2. It acts like clay in that it tends to stop plant foods from being leached from the soil.
3. In areas containing plenty of lime humus tends to accumulate in surface layers, in acid soils it moves further down.
4. It binds a sandy soil and opens a clay soil. This binding action is dependent upon the presence of lime, as with lime this humus forms a sticky colloidal substance which causes clay particles to "crumb" together.
5. It increases the water-holding capacity of the soil by an amount which may easily reach 3-4 per cent.

"So marked are the physical properties of humus," says Sir John Russell, "that if 15 to 20 per cent. of organic matter is present in a soil the operation of all other factors ceases to count for much, and the distinctions between sand, clay, and loam are obliterated."

Whether or not we get an accumulation of humus will depend upon the relative activity of both sets of factors. In hot, dry, well-drained soils the destructive process predominates. In cold, wet, and poorly aerated soils we invariably get the accumulation of organic matter, as under these conditions the destructive bacteria are much less active.

Wheatgrowing in Australia is definitely dependent upon fallowing, for which many advantages, including the accumulation of nitrates, are claimed. We do, however, hear too much about its advantages and give little consideration to its one great disadvantage. As a result of misuse the advantages have in many areas of this State, including parts of this district, been turned into disadvantages. I am not suggesting that wheat should be sown without fallow in these areas, for in such areas where fallowing has now become unprofitable wheatgrowing under any conditions is unprofitable, and some other use must be sought for the land.

The climate of Southern Australia is characteristically hot and dry throughout a considerable portion of the year. A well-worked fallow under these conditions provides ideal conditions for the working of a soil bacteria. As stated previously these bacteria feed upon soil organic matter to form nitrates, thus depleting the supplies within the soil. Under average climate and soil conditions of South Australia it is claimed that as much as 1 ton per acre of organic matter is lost during each fallowing period.

The necessity for making good this loss should be obvious to all, but during recent years with their hardships many men have adopted the policy of cropping their land to the utmost in the hope of "something turning up." Such a policy of continuous cropping without replenishing the losses, must, of course, lead to failure.

The effect of such farming systems upon the soil will be dependent upon soil type, as the general "make-up" of sandy and clay soils is so different. Sandy soil, as stated previously, requires the presence of fairly large amounts of humus to ensure its perfect physical condition. Unfortunately under a fallowing and cropping system this type of soil is the most severe loser of organic matter. It does not take many years, therefore, for such soils which were previously fertile to be converted into an unfertile mass of loose, incoherent soil particles of very poor water-holding capacity. The sequel to this is drifting, which is now a severe problem in many wheat districts.

With the heaver types of soil the effects of overcropping are not so apparent to the casual observer. They are also slower to develop, but, nevertheless, the policy of fallow cropping cannot be persistenty pursued without disastrous results. Such soils eventually lose their friability or crumb structure, and become impossible soils to work. Draught is considerably increased, and the surface particles "run together" and "cake" even after moderate rains. Seeding under such conditions, then, becomes an even greater gamble than usual.

Thus it has been seen that the policy of persistent fallow cropping must eventually have its detrimental effect even upon the best lands to be found within the wheat belt proper. The problem which now confronts us is: "How best can we overcome this difficulty?" We must, of course, treat the cause and not the effect. Fallowing periods must be fewer and farther between, and we must introduce a means of increasing the amount of organic matter in the soil. The problem, therefore, becomes one of widening the rotation by introducing pasture years, which in turn, of course, means diversification of farming.

One hears it said far too often that such and such a paddock will not grow enough feed to warrant leaving it out. If paddocks in certain areas are going to be left in the hope that some feed will come up, the statement may be more or less justified—mostly less. If it is known that good grass growths are not usual, then something must be sown to ensure that some growth does occur.

The choice of species to sow in normal and poorer wheat districts is definitely limited and would include oats, barley, peas, and Wimmera Rye Grass. Oats and barley—especially the latter—will, of course, grow in practically all wheat districts, whereas Wimmera Rye Grass and Western Australian White Peas will be more suited to selected localities. All four are, however, admirably suited to the Balaklava district, especially the better parts.

Looking at feed from the soil point of view only, it would effect the greatest improvement upon soil fertility if ploughed in as green manure. The economics of such a system is, of course, unsound in view of the figures quoted earlier, and no one under normal circumstances would recommend green manuring to wheat farmers. Farmers do, however, like all other people, very often seek the easiest way out in that they burn off and destroy, from the point of view of organic matter, growths which with a little extra trouble might have been turned into the soil, and therefore rendered useful.

The Necessity for a Systematic Rotation of Crops.—Haphazard methods get no further in agriculture than they do in any other sphere. We know, of course, that the best of systems gives disappointing results at times, but some sort of a system is invariably better than none at all. For the Balaklava district there is a choice of two proved systems, viz., fallow, wheat, pasture, or fallow, wheat, oats or barley, pasture. Either will prove effective in the long run, but the frequency of the pasture years should be particularly noted.

WOLSELEY ANNUAL FALLOW COMPETITION.

[Judged by E. S. ALCOCK (District Agricultural Instructor).]

Details of points awarded to each competitor are given in the following table:—

Name.	Address.	Position.	Compactness of under-layers.	Condition of seedbed.	Condition of mulch.	Suitability of depth.	Freedom from weeds.	Total.
	Max. Points—		25	15	15	20	25	100
E. W. Sharrad (1)	Wolseley	1	21½	12	13	17	23	86½
G. D. Butler	Wolseley	2	21	13	13½	16½	22	86
R. A. Grosser . ..	Wolseley	3	22	13	13	16	21	85
H. K. Ridway . ..	Wolseley	4	20	12	12	14	22	80
E. W. Sharrad (2)	Wolseley	5	19	11	11	14	22	77
A. E. J. Grosser .	Wolseley	6	19	11	11	15	20	76
H. C. M. Pilgrim .	Wolseley	6	20	11	11	14	20	76

1. E. W. **Sharrad**, Wolseley, 50 acres, No. 1.—This entry consisted of red and black loam. Ploughed with mould-board plough 10th July to 22nd August. Cultivated with rigid tine cultivator last week in September, again first week in November. Harrowed 12th November, again on 7th January. Underlayers were fairly well packed together, but were rather open and dry. Seedbed showed some unevenness, especially where tractor wheels had consolidated the land when wet. Mulch was of fair depth, a little rough in places. Very clean and free from weeds. A few missed places were also noticed on headlands.

2. G. D. **Butler**, Wolseley, 50 acres.—A very even piece of grey, self mulching loam. 42 acres were scarified during June with a Gersch scarifier, and the remaining 8 acres were ploughed. The larger area was scarified during August and again in November. The remainder was harrowed in August and again in September, and then scarified in November. Underlayers were rather open and looser than usual. Seedbed fairly regular. Mulch very good; may have been somewhat shallow in places. Some straw was noticed where fire had missed it. A few places missed. Very clean and free from weeds.

3. R. A. **Grosser**, Wolseley, 50 acres.—This entry was situated in a fine paddock of grey land. Ploughed with mould-board plough in August and early September, then harrowed and spring-toothed last week in September and early October then cultipacked. In January harrowed twice. Under layers were well packed down, but were cracking a good deal. Seedbed was in very fair order. Mulch was somewhat shallow with a few pieces missed. A few weeds, paddy melons, and clover were showing. If sheeped, this could have been cleaned of weeds.

WOLSELEY—ALL FALLOW.

This class has also been a regular feature of this Bureau's activities, and this year only three entries were received. Details of points awarded to each one are given below:—

Name.	Address.	Position.	Compactness of underlayers.	Condition of seedbed.	Mulch— Condition and suitbility.	Mulch— Suitability of depth.	Freedom from weeds.	Total.
	Max. Points—		25	15	15	20	25	100
R. A. Grosser . . .	Wolseley	1	22	12	13	16	21	84
E. W. Sharrad . .	Wolseley	2	20	11	12	14½	22	79½
H. C. M. Pilgrim .	Wolseley	3	19	11	11	13	20	74

1. R. A. **Grosser**, Wolseley, 130 acres.—Grey loam, ploughed during August and completed early in September with mould-board plough. Harrowed and spring-toothed end September and first week October. Again spring-toothed early November, then cultipacked. Harrowed in January. Harrowing during January in such a dry season should prove useful. Seedbed was in fairly good order. Mulch somewhat shallow. Some weeds were germinating, and some which sheep could have kept in check. A fine paddock which should grow a good wheat crop and the smaller area is much better worked.

2. E. W. **Sharrad**, Wolseley, 110 acres and 80 acres.—This entry consisted of two paddocks; the larger paddock had probably more grey land than red. Ploughed with mould-board plough during July and August, cultivated during September and November, also harrowed in November and January. Although under-layers were well consolidated in places, they were very dry. Seedbed showed some unevenness. Mulch rough in places, but fair depth. Very clean, free from weeds. The smaller paddock had a greater proportion of red land. This paddock was not ploughed, but scarified twice during October and then spring-toothed in January. Not in the same condition as the earlier worked entries.

3. H. C. M. **Pilgrim**, Wolseley, 150 acres, 170 acres, 140 acres.—The largest area of fallow entered this year; over 400 acres of mostly black land. All worked for the first time during April, two with the Sundercut disc and one with mould-board plough. Then they were all worked practically the same. Scarified in June and August and cultivated during November. For the area being handled, this was a very fine entry which should yield a fine crop of wheat. The under-layers were rather open and loose, and seedbed somewhat irregular. Mulch was shallow in places, and rather rough. The few weeds were Paddy Melons, Cockspur, &c., and a few pieces were missed.

NELSHABY AGRICULTURAL BUREAU.

ANNUAL SEED WHEAT COMPETITION, 1936.

[Judged by E. L. ORCHARD (District Agricultural Instructor).]

RESULTS.

Position.	Name.	Variety.	(*a*) 25.	(*b*) 15.	(*c*) 15.	(*d*) 20.	(*e*) 15.	(*f*) 10.	Total Class II. 100.	Total Class I. 200.
1	F. Jose	Currawa	25	13	14	19	13	8	92·00	179·00
2	F. Jose	Nabawa	21	13	14	20	12	7	87·00	
3	L. H. Noll	Currawa	24·25	13	14	18	13	7	89·25	173·25
4	L. H. Noll	Nabawa	19·50	12·5	14	19	12	7	84·00	
5	L. C. Roberts	Ranee	23·25	14	14	17	14	7	89·25	177·25
6	L. C. Roberts	Nabawa	22	13	14	17	13	9	88·00	
7	L. C. Roberts	Sword	21·75	13	14	19	13	9	89·75	183·00
8	L. C. Roberts	Currawa	24·75	13·5	14	19	13	9	93·25	
9	H. Franks	Nabawa	22·25	12·5	12·5	18	13	7	85·25	176·75
10	H. Franks	Currawa	23·50	13·5	14	19	13·5	8	91·50	
11	H. Williams	Waratah	21·50	13	14	17	13·5	8·5	87·50	173·00
12	H. Williams	Nabawa	20·50	12·5	13	19	12·5	8	85·50	
13	R. P. Noble	Ranee	23·50	12·5	14	17	13	8	88·00	172·75
14	R. P. Noble	Nabawa	21·25	13	12	17	13·5	8	84·75	
15	J. H. Franks	Nabawa	20·75	12·5	14	16	13	7	83·25	166·00
16	J. H. Franks	Waratah	19·75	14	14	15	14	6	82·75	
17	T. Davies	Nabawa	20·75	13·5	14	19	13·5	8·5	89·25	182·00
18	T. Davies	Currawa	24·75	13	14	19	14	8	92·75	

(*a*) Weight per bushel.
(*b*) Plumpness and evenness of grain.
(*c*) Freedom from visible admixture.
(*d*) Freedom from bunt, weed seeds, &c.
(*e*) Freedom from injury in harvesting.
(*f*) Freedom from dirt, chaff, straw, &c.

This praiseworthy endeavour on the part of the members of the Nelshaby Branch of the Agricultural Bureau to maintain an improved standard for the seed wheat sown in the district has now been conducted annually for nine seasons.

On this occasion, in keeping with the importance of the year, an extra effort was made to obtain as many entries as possible, as Messrs. J. A. Lyons and R. D. Nicholls, M's.P., had presented a trophy for the entry gaining the highest aggregate of points.

The committee conducting the Competition was therefore gratified to receive a total of nine entries, which entailed the submission of 18 samples in all for judging. These were duly collected by an independent representative, 2lbs. of grain being taken from 5-bag quantities stored in the barn of the individual competitor, sealed and numbered where obtained, and tabled for examination to the following scale of points:—

	Points.
Weight per bushel	25
Plumpness and evenness of grains	15
Freedom from visible admixture	15
Freedom from bunt, weed seeds, &c.	20
Freedom from injury in harvesting	15
Freedom from dirt, chaff, straw, &c.	10
	100

The Competition was as usual divided into two classes—No. 1 requiring two varieties of seed wheat, and No. 2 the champion variety selected from all exhibits. In the former the samples numbered 7 and 8 of Sword and Currawa respectively entered by Mr. L. C. Roberts were awarded a total of 183 points, thus becoming the winner in that class, with Mr. T. Davies (17 and 18), exhibiting Nabawa and Currawa, to gain 182 points, filling second place. The position of Champion Variety is filled by Currawa, which obtained 93.25 points for Mr. L. C. Roberts.

Weight Per Bushel.—This produced a variation from 66¼lbs. down to 60¾lbs., the average of the whole exhibits being practically 63½lbs.—a satisfactory figure when compared with the means of previous years. Nabawa was disappointing in this regard, only one entry of that variety tipping the beam at 63½lbs., the remaining seven of the group of eight varying between that and the lowest weight of 60¾lbs. Currawa weighed consistently well, the five entries of the variety making an average of 65.7lbs., whilst two samples of Ranee were as well above the average as the Waratah and Sword were below it.

Plumpness and Evenness of Grains.—Varietal differences only accounted for a little variation in regard to plumpness, the elongated grains of Nabawa contrasting with the "shotty" Ranee kernels, and the characteristic crosswise crease of the Currawa. Ranee conformed to an evenness only equalled by the Waratah, with Nabawa presenting a percentage of undersized grains in one or two entries.

Freedom from Visible Admixture.—In two or three instances doubt was felt regarding odd grains not complying with those of the variety exhibited, but the majority of the samples gave little cause for comment under this heading.

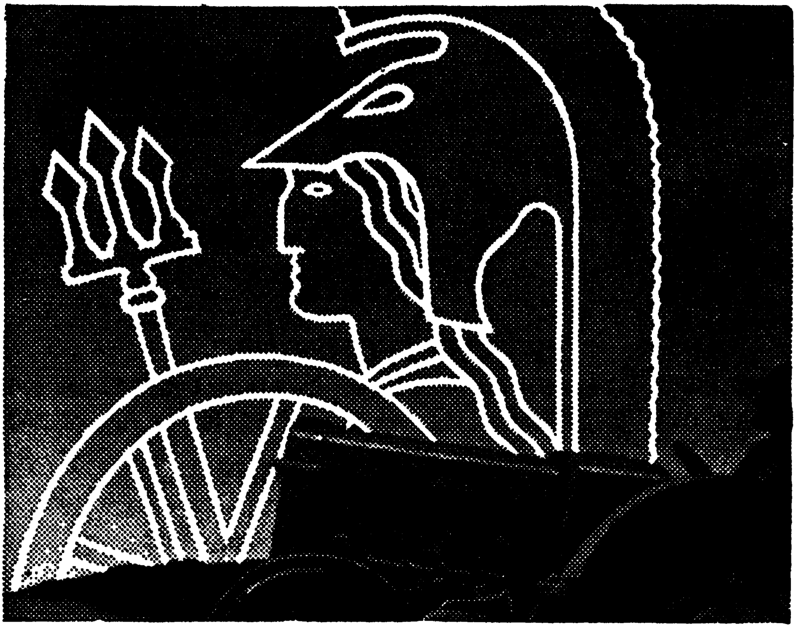
Freedom from Bunt, Weed Seeds, &c.—Grains of barley unfortunately intruded in several of the exhibits, both it and bunt balls being noted in one entry. The question arises as to whether wheat sheltering barley should be classed as grain suitable for sowing. Odd weed seeds of other kinds were found occasionally, but apart from the barley, no great trouble was experienced in this respect.

Freedom from Injury in Harvesting.—Taking the exhibits right through, there was also a pleasing absence of this disability, though now and again the longish soft grains of Nabawa had apparently suffered to a greater extent than the others, whilst one sample of Waratah compared more than favourably with the majority.

Freedom from Dirt, Chaff, Straw, &c.—A sprinkling of chaff was noted in all of the samples, it being the retention of a few glumes only in most instances, an odd node or two in addition appearing in the remainder of the entries. Apart from thistle, exhibits as a whole were quite free from dirt. That the grain was of a uniformly high grade throughout is indicated by an average allotment of almost 88 points per sample, thus demonstrating the essentially useful work, in one direction alone, undertaken by the Nelshaby Branch members.

KILLING AND CURING A PIG FOR HOUSEHOLD USE.

In the course of a paper read at a meeting of the Whitwarta Branch held on 18th May Mr. W. H. Hoepner stated:—"On most farms each year at least one or two pigs are kept for killing to supply ham, bacon, and lard for household use. When these three products are required the Tamworth-Berkshire cross is preferable, as this type of pig will fulfil those requirements better than other types with a less amount of feed. Where a large pig is desired for killing, a weaner or slip is best obtained for killing the following winter. It should then weigh about 300lbs. If the ham and bacon is to be used immediately after curing a smaller pig is better, but when the meat is to be kept for some time it will be found that larger hams and bacon retain a much better flavour. The streaky bacon which is mostly desired is obtained to a certain degree by the feeding method. This is done by keeping the pig in store condition to within three months of killing, then feeding grain to the greatest extent. No matter how fat the pig appears it will give bacon with a fair amount of streak. Killing of the pig is best done during the winter months, as otherwise the thickness of the sides and larger hams will prevent it from cooling and setting thoroughly during the night, which is essential if the hams and bacon are to be kept for some months. Sticking the pig so that it bleeds thoroughly is also essential if the curing is to be successful. To pierce the throat so that it bleeds freely, strike with the blade of the knife entering in a direct line for the tail. The scalding so that the hair comes away freely is best done in a sheltered position away from cold winds. Do not have the water too hot. If the hair does not come away freely through the water not being hot enough it can be made hotter. If the water is applied too hot the flesh will be scalded. Where a person has to do the scalding alone, pour the water on a section of the carcass, scrape this clean, and continue with another section. If more hands are available, dipping the whole pig in a tub or vat is quite satisfactory. After scraping, the pig is suspended on the gallows, and the head taken off. To do this cut right around through the flesh to the bone about 2in. behind the ears. A short twist will then dislodge the head from the body. After taking out the intestines, the fat which is to be rendered down for lard can be taken out cleanly to the last particle. If one is careful to get it loose at the bottom by inserting the thumb between the thin skin which covers the fat and the ribs, and then pull upwards, the whole of the fat will come away from one side in one piece. If the intention is to roll the bacon after curing and the pig is a large one, instead of cutting straight down the centre of the back cut down through the flesh from the back of the pig about 1in. from each side of the centre of the back from top to bottom; then cut through the flesh to where the ribs join the backbone and saw these bones through close to the backbone. The morning after the pig has been killed the meat should be cut up as required, the



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EGGS—July to September.

Intending breeders should realise the importance of establishing their flocks with only the very best of stock, also pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2oz., and a large percentage considerably over.

All Eggs and Chickens sold from Parafield Poultry Station are guaranteed to be produced at Parafield.

EARLY BOOKING IS ADVISABLE.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

sides being cut out for the bacon, and the ribs taken out if bacon is to be rolled later. The hams should be cut to shape, and the fore-parts cut into smaller sections for curing. The two methods of curing are by dry salting and by curing in liquid brine. Curing in brine is the most satisfactory method of the two, and is done as follows:—The day on which the cutting up is done all the meat for curing should be rubbed sparingly with dry salt prior to putting it in the cask or vat in which the curing is to be done. The brine which is to be put over the meat is made from the following ingredients:—18lbs. salt, 10ozs. saltpetre, 1½lbs. white sugar, 12galls. water. Bring this mixture to the boil, then when thoroughly cold pour it over the meat. The smaller pieces, which are usually used as pickled pork, will be cured within a week. If the pig was 300lbs. in weight the bacon should be left in the brine a fortnight at least, and the hams a month. A point which assists in the successful curing of large hams and bacon is to select some shaded position where the cask or vat containing the meat can be stood so that a continual circulation of fresh air surrounds it. After the curing period, if the bacons are to be kept some time they should be rolled on the day they are taken out of the brine. They do not then become so dry and hard. The process of smoking the bacon and ham can be done in any small enclosure, as long as the smoke can circulate freely around them, continuing until the outside appearance is of a golden colour. Precautions must be taken when doing the smoking to ensure there is no heat. Good results are obtained by putting a few red coals in a dish and covering them with damp sawdust.''

HINTS ON THE FARM.

At a meeting of the Wasleys Branch, held on 7th May, Mr. V. W. Day described various articles which could be made on the farm. Swings for a horse team could be made from piping and old thresher drive chains by riveting or sweating steel ends into 1½in. or 2in. piping, using 21 links of chain instead of iron rods, and placing the hitch-up hook in the centre link. Swings should be wide enough to prevent horses' sides from being chafed. Single swings should be about 38in. to 40in. wide, allowing 16in. per horse for spreaders used in large breast teams. Couplings should be not less than 27in. long to allow the team to be turned without trampling on and unnecessarily jostling one another. If the chains or traces used were at least 9ft. long the swings would not hit the horses' heels. Tying back fast horses was unnecessary. They should be placed in different positions in the team until their proper place was found, although it was preferable for a horse to be trained to work anywhere in the team. If, however, a horse had to be held back the use of a double eccentric bit in the bridle would hold the horse, no matter in which direction he pulled. Bridles could be repaired quite simply by riveting straps of hoop-iron up the sides; the blinders could also be kept in position by riveting a piece in a vertical position just behind the bulge. The forehead strap should be left free at one side to allow to-and-fro movement for the choke strap. A strap that was too tight caused the horse's head to become sore. Reins or narrow straps could be mended strongly by cutting the ends straight across, placing two pieces of fine galvanized wire through awl holes and hammering them down firm and snug. Such a join would not give way under a straight pull of considerable power. Elaborate stabling was unnecessary, stables being useful only for the convenience of catching and harnessing. During fine weather horses preferred to feed in the open. An occasional syringing of phenyl and water on the legs of animals would rid them of leg-itch. For cutting the hooves of young horses an instrument made similar in form to a plough scraper and heated like a searing iron was more effective than mallet and chisel. Mr. Day's method of rearing a foal was to shut up the foal, when a few weeks old, in a yard close to the stable. The yard should have rails at the front, which would permit the foal to put its head through and suck the mare. In the course of time both foal and mare became accustomed to being apart at feeding time, and after a time forgot each other. The foal could be kept in the yard for 8 or 9 months, and should be taught to be tied up with a halter. When green feed was plentiful the foal could be turned out into the paddock with other horses. Oaten hay of good quality was preferable for feeding horses. The quality of the hay depended on the manner in which it was cut and stooked. If the hay was heavy and green it should be left to dry for a couple of days prior to being stooked, but very light hay should be stooked as soon as possible after mowing. During rush periods the midday feed should consist of 1½ dippers of pure oats.

SUNDRY HINTS.

Clothes-props could be made from galvanized pipe, with a slot cut in one end, placed in the clothes line, and a ferrule screwed on to keep the prop in place. *Holes in Troughs* could be repaired by means of a gutter bolt and a piece of good leather or tin. *Rolling Barbed Wire.*—A forked stick, long eonugh to enable the operator to stand erect and wind the wire, could be put away with the wire and used again when it had to be unrolled. *Cleaning Stars of Drills.*—Stars should be placed in hot water. If waste engine oil was smeared on them before they were replaced they would be more easily cleaned next time. *Bedding for Pig Sties.*—Dry horse manure; also useful for keeping animals clean if put on decks of motor trucks. *To Stop Pigs Rooting.*—Drift sand placed on floors of pig-sties; would also prevent rats from burrowing in floors.

DOES IT PAY TO BREED OUR HORSES?

The above was the subject of two papers read at a meeting of the Appila Yarrowie Branch on 1st May. Mr. E. B. Wurst stated that it paid the farmer to breed his own stock because he knew just what he was getting, whereas if horses had to be purchased he had to take the word of the seller. It was cheaper to breed high class stock than to buy, because good horses had become scarce. A good horse would cost approximately £40, making the cost of a 12 horse team £480. In the case of a farmer breeding his own stock, 6 mares could be bought for £240, and stallion fees would cost £4 per mare. If all mares foaled each year, at the end of four years the breeder would have 30 horses, comprising one 12 horse team, six three-year olds, six two-year olds and six yearlings. The stallion fees would amount to £96, the total cost of stock being £336, not including expenses of feeding, housing, &c. Many farmers who kept horses and did not breed from them had sold their horses and bought tractors, because it did not pay them to keep horses without breeding from them. Many such farmers had recently gone back to the use of horses, as they realised that it paid to breed their own stock and they could not breed tractors. It might be said that the farmer who bred his own stock could not work his mares all the year round. However, the man who bred horses usually had a few horses to spare and could at least spell the mares for a few days after foaling. It might also be said that there was a risk of losing mares in foal, but the risk from that source was no greater than from injury, sickness, etc. In many years of breeding the writer had not lost a single mare in foal, although six had died from disease, broken legs, etc.

In his paper Mr. L. B. Klemm referred to the considerable expense of purchasing a good type of stallion, which was often beyond the means of the average farmer. Feeding the stallion entailed a great deal of work and attention. Working the stallion in the team meant a lot of trouble and constant watchfulness. For the price paid for a stallion one could purchase three or four working horses. In breeding foals one had to give the mare a good deal of attention, and when the foal was born it must be cared for and fed for 2 years before it could be broken in to work. Travelling a stallion was not profitable. It was necessary to insure the stallion and man and pay the man a good wage; by the end of the travelling season the owner would be out of pocket.

CARE OF LIVESTOCK.

In the course of a paper read at a meeting of the Warramboo Branch on 8th May, Mr. O. J. Murphy stated:—"Clearing sales have indicated in numerous cases that the value of horses on many farms is almost half the total value of stock and plant, excluding sheep. From a business point of view then, if from no other, the horse is well worth caring for, and the most profitable horse is the one which works well, feeds well, and requires little or no veterinary attention. A good supply of drinking water is the first essential. The horse should always have access to water before feed is given to it. This is a matter of first rate importance. In the pioneering days of the West Coast, when wheat was carted long distances by horse teams, and water supplies were few, teamsters were frequently forced to feed their horses at the terminal points while their wagons were being unloaded, and to water the teams afterwards. This practice so seriously affected many of the animals that supplies of carbonate of soda invariably formed part of the equipment of the long distance carters. Feeding should be done at regular intervals—four times a day when the horse is working hard. Two small feeds are better than one big one. Feed on chaff three times a day and give long hay at night. If cocky chaff is used it is advisable to feed in boxes or mangers which will allow the dust to escape. It is very difficult to obtain cocky chaff free from dust in mallee areas. Regular work and regular feeding practically throughout the year will result in fewer ailments than heavy work over a few weeks followed by long spells of idleness. The word 'condition' is often misapplied, and is perhaps better understood by trainers of race horses than by farmers. The horse which has fattened quickly during a spell of idleness on greenfeed looks well and is said to be in good condition, but it is a dangerous condition for hard work. A discriminating owner will work his horses with the greatest care after a spell on good paddock feed. Although the horse is then fresh and lively, and perhaps a little difficult to catch, it is not wise to knock him out with long days in the cultivator or plough. Stop the teams once or twice each round, and work comparatively short periods for a week or so. By so doing you will avoid sore shoulders, and possibly digestion upsets. A soft sweating horse with a well fitting collar is probably more likely to get a sore shoulder than a hardened horse wearing a collar two sizes too big. If the so-called condition which the horse has put on during his spell is worked off gradually, you will obtain that real condition which will allow you to work your team steadily over long hours. The in-foal mare may be handled in the same way as the gelding. Steady work right up to foaling time is more beneficial than otherwise. Experience has proved that foaling risks are extremely light if the mare is kept at work. The time to spell the mare is when the foal is born. Many stock troubles are due to deficiency in diet, which usually results from a deficiency in the soil. That deficiency is phosphoric acid, and is supplied by the application of superphosphates. Other elements such as lime are present in ample quantities. It is obvious that in new mallee areas such as ours, the deficiency noted can only be made up after many applications of superphosphates over a number of years, and while that deficiency exists to a marked degree it will be found necessary to give to stock that which is lacking in their daily feed. This can be done by providing licks for horses, and by feeding sterilised bone meal to cattle. The disease known as "dry bible" can be prevented if suitable licks are provided for cattle. If licks are not accessible to stock at all times, they should at least be provided when the cattle are seen picking up bones or other rubbish and when horses are seen chewing the bark from trees."

CARE OF FARM HARNESS.

At a meeting of the Koppio Branch held on 6th May, Mr. F. Gardner read a paper "Care of **Farm Harness.**"

Mr. Gardner stated:—"Harness should always be kept out of the weather when not in use, and it is a good plan to have a separate shed for the harness instead of hanging it on a nail in the stable. Have a peg for each set of collar, hames, and winkers, and each horse's harness can then be kept to itself; workers and buggy harness can have its own place.

A few pegs should be provided for leading harness and saddles. For oiling harness get a 12-gallon oil drum and cut round the ends half way and then down the middle along the seam, and then fold back the piece so as to form a drain when put up alongside a wall under a peg.

Into the drum put all the winkers, placing them as closely as possible, and then pour over them sufficient good leather oil to half cover them. With a tin or ladle dip oil from the sides of the winkers and pour it several times over the ones not covered. After an hour or two change the position of the winkers so that the top ones will be on the bottom in the oil. After about half a day the winkers can be taken out and drained by hanging them on the peg above the drum and the oil runs back into the drum, which is then ready for hame straps, breeching straps, belly bands, spiders, reins, which can be folded into a short space. While they are soaking get to work with a brush on the collars, which cannot be soaked.

Give each collar a good coating of oil with the brush—as much as will stop on—and hang it on its peg until all have been done, and then start over again, as by that time the first one will be ready for another coat. This should be continued until the leather will not absorb any more oil.

Do the same with the saddles, until you cannot get any more oil into them, and then hang them in their places.

During the oiling process one has a good chance of finding any places that want stitching or riveting. If a farmer keeps a packet of assorted copper rivets, or better still, a ball of hemp, some wax, a couple of needles, and an awl, he can keep the harness in reasonable repair, and often save it from going to pieces to such an extent that it requires to be sent to a saddler.

Rivets should not be used for reins, as they are apt to catch on hame rings or other parts of the harness or implements, and when pulled will come off suddenly and jerk the horses' mouths.

After going over the winkers, reins, hame straps, and spiders, look to the collars. If stitching is required it came be done with a piece of good sewing twine, either soaped or waxed. If a collar is not too bad it can be made to last a considerable time.

A collar that gives a horse a sore shoulder should be marked and a slit cut in the check about an inch long, a bit of horse hair being worked around the patch with a stilletto or fine punch, and filled around the spot to raise it off the sore. The sore will then generally heal in short time.

Of various leather oils tried, the best is Shell compound neatsfoot. It is very penetrating and lasting, and is cleaner than most others. Three gallons of this oil will oil the harness of a 10-horse team twice a year."

During the discussion, Mr. Low said that he has a tender-skinned mare, and by cutting and moving the stuffing in the collar he had managed to cure her shoulders, but the collar was not of much value. He used equal parts of blacklead, boracic, and Coachalene to rub on any galls or light collar sores. He preferred Vacuum leather oil, as it left no surface oil to dirty the hands. Mr. Cooper found that a sheepskin pelt made a good false collar (skin side to horse) when collars became too large. He had used a wood collar with advantage to his horses. For a horse that was subject to sore shoulders he had bought a new leather-lined collar, soaked it in water for 2 days, fitted it while wet, and worked the horse. The collar pulled to the shape of the horse's shoulders, and the horse had no more sores. Mr. Wait disliked working horses with sore shoulders, but did not favour cutting collars, as it let dirt in. He eased the stuffing away from places where there were tender spots with the aid of a long awl. He did not like harness spongy with oil. Mr. M. T. Gardner's practice was to buy 4 gallons of Shell Compound oil each year and pour it into a 12gall. drum from which one end had been cut out. He dipped the harness into the oil and removed it immediately, placing it on a sheet of iron which allowed the surplus oil to drain back into the drum. He had in use 3 pairs of winkers 30 years old which had been regularly oiled. After being used on harness the compound neatsfoot oil was useful as a rust remover, and for oiling iron work on machinery and in the blacksmith shop. He preferred to oil harness on very hot days, and to do the job in a shed. Under those conditions it did not get too much oil. Mr. F. Gardner exhibited several collars with stuffing adjusted to ease sore shoulders, and also several pairs of winkers which he had bought cheaply and restored to softness by oiling.

DRILL OR COMBINE FOR SEEDING?

Papers dealing with the merits of the drill and combine as seeding implements were read at a meeting of the Morchard Branch on 8th May. Mr. C. Schulz stated that the drill was a surer implement than the combine, and gave a more even seedbed. The drill enabled the farmer to sow the seed at any depth, and the more even sowing resulted in quicker and more even germination. The drill destroyed more weed growth and gave the soil an extra tillage. The combine was admittedly cheaper to use, but wheat sown with a drill would yield up to 2bush. per acre more than with a combine. That fact had been proved time and again, nine out of 10 crop competitions having been won with crops sown with the drill. The land must be well cultivated before the drill was used. Most farmers made a mistake in harrowing before cultivating. Harrowing only disturbed the top soil, leaving the underlayers lose and lumpy. Cultivating before harrowing gave a better seedbed. If the latter practice were adopted, together with the use of the drill, farmers would grow more wheat than with the use of the combine. The drill left a small farrow which caught any moisture falling directly over the seed, whereas the combine left a small crown.

In his paper, Mr. C. Halliday stated that many looked upon the combine as the ideal machine for seeding. It was certainly a great help to a man who was seeding on his own, but it was not necessarily the best implement for the work. It was doubtful if the combine was a success in destroying weeds. Well rooted weeds were only hoed up and left to grow better than before. Some farmers stated that if rain fell overnight land that had been combined was seeded and ready to germinate, but the writer questioned whether such grain was sown to the best advantage. A big fault with the combine was that it would continually sow too deeply in dry ground. Deep sowing resulted in thin unhealthy plants which would never give a good return. Much of the drift in dry districts could be attributed to the use of the combine, which worked only the to soil, allowing it to blow away in the wind. In cases of dry seeding the combine had yet to produce as good a crop as the drill. The combine was ideal for levelling a paddock, if worked across the old workings.

FISHING ON THE RIVER MURRAY.

In a paper read before the Ramco Branch on May 4th, Mr. A. Modystach stated:—Each fisherman pays a licence for a certain stretch of the river and he is the only one allowed to use nets and cross lines in that portion. Two pegs might be seen about 10ft. apart, standing up in the water near the bank and further up stream another peg. This would be a "drum net" as it is called. It is made of string and is set facing down-stream, the two pegs holding the wings apart and the single peg holding the closed end. A cross line is a line with numerous hooks at certain distances apart laid across the river. The chief fish caught are the Murray cod, callop and bream. It is said that cod grows 1lb. per year but if so some of the big fish caught must be very old.

Fishing is not what it was before the locks were built in the river, according to most of the men who were fishing in those days. However, the locks have steadied the current considerably, while the river is kept at a higher level. The reeds and rushes are more plentiful and therefore the river is more suitable for the breeding of young fish, because in the reeds they are fairly safe from pelicans, cranes, shags and other fish-eating birds. With still water the feed is more plentiful, the fish are fat and do not swim far for it and thus are harder to catch and seem more scarce.

Very little is known as to whether fish travel far. Some fishermen say they are continually travelling up-stream. If this is true, in a short time most of the fish would be below one lock or another and few in other parts of the river. When the Fishing Commission was in the district they suggested to the fishermen that all small, undersized fish caught be kept and put in cages. When next the Inspector came up such fish were to be collected and freed in different places after being marked with a smal metal disc stating the place and date of liberation. When caught later the fisherman was to notify the Inspector where it was liberated and where caught. By this means something definite would be known as to their habits.

HINTS ON FALLOWING.

Paper read by Mr. T. Peake at a meeting of the Monarto South Branch held on 16th May, 1936:—July is a good time to commence fallowing. All farmers by this time should have the necessary implements and harness in thorough working order to save any delays. It is also necessary to see that the horses do not get down in condition during seeding time, as this will cause a considerable delay, especially if the job is a long one. A medium weight mouldboard plough with a P. shear is a most suitable plough. It makes a clean cut, and lasts longer than most other steel shears. Heavy soil should be fallowed at a depth of not more than 3in. Special care must be taken not to interfere with the subsoil, especially if the clay is shallow. No good results can be expected unless this care is taken. Light or sandy soil should not be fallowed more than 2in. to 2½in. deep, as this class of soil will not need as much working. The heavy land should be allowed to set for some weeks before being disturbed, and then harrowed after a rain to break down any clods and level the soil if necessary. Cultivating should then be done at intervals after a rain of about 35 points in order to keep the soil free of weeds and to retain further moisture.

SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		SOUTH-EASTERN DISTRICT.		
Allandale East .	1/5/36	13	"Tree Culture"—R. M. Hastings	R. T. Laslett
Penola	8/5/36	13	"Grasses and Clover"	F. W. Hinze
Mount Gambier	8/5/36	75	"Agriculture in New Zealand"—L. De Garis	A. L. Warren
Rendelsham ...	13/5/36	7	Garden and Potato Competition Reports—A. L. Warren	F. Todd, jun.
		UPPER NORTH DISTRICT.		
Booleroo Centre.	24/4/36	13	"Farming in Lincolnshire" W. Seismey	J. J. McCarthy
Appila-Yarrowie	1/5/36	15	"Does it Pay to Breed Horses?"—E. B. Wurst and L. B. Klemm	E. H. Wurst
Warcowie	5/5/36	11	"Timbering a Well"—W. A. Crossman; Paper—Hon. Sec.	A. F. Crossman
Baroota........	14/4/36	6	"Wool-scouring"—Hon. Sec.	E. W. Hulster
Morchard	8/5/36	15	"Seeding"—C. Halliday and C. Schulz	E. T. Tilbrook
Yandiah	8/5/36	14	Question Box	E. C. Keller
Wirrabara......	1/2/36	12	Harvest Reports	F. E. Borgas
Wirrabara......	29/2/36	5	"Pigs as a Side Line"—O. Jaeschke	F. E. Borgas
Wirrabara......	28/3/36	10	"Road Making"—G. Sizer	F. E. Borgas
Wilmington	12/5/36	17	Address—Hon. A. P. Blesing, M.L.C., Minister of Agriculture	Chas. Cole

SUMMARY OF REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		UPPER NORTH DISTRICT—*continued.*		
Baroota........	11/5/36	9	Discussion—" Ailments of Livestock "	E. W. Hulster
Booleroo Centre.	22/5/36	8	Address—E. L. Orchard .	J. J. McCarthy
		MID-NORTH DISTRICT.		
Mount Bryan ..	25/4/36	11	" Thatching "—T. P. Griffin ; " Trip to R.A.C."—H. Hooper and H. Griffin	A. A. Jefferies
Beetaloo Valley	4/5/36	14	Question Box	B. W. Giddings
Narridy	2/5/36	26	" Finance "—M. Reynolds	J. Klingner
Wandearah.....	5/5/36	14	" Power Farming "—E. T. Sinclair	L. A. Jacobs
Jamestown	18/5/36	6	" Peas on the Farm "—E. L. Orchard	R. B. Phillips
		LOWER NORTH DISTRICT.		
Rosedale	4/5/36	19	Address—F. E. Waddy ..	W. E. Georg
Light's Pass ...	4/5/36	16	" Fencing "—T. W. Roenfeldt	C. A. Verrall
Whitwarta	4/4/36	16	" Poultry "—E. W. Wilson	C. W. Dunow
Penwortham ...	18/3/36	7	Address—J. B. Harris ...	A. R. Jenner
Penwortham ...	8/4/36	19	Address—S. McNamara .	A. R. Jenner
Nantawarra	7/5/36	12	Paper from *Journal*	M. P. Hamdorf
Koonunga......	6/5/36	13	Debate—Country *v.* City	H. Mibus
Sutherlands	2/4/36	16	Address—W. C. Johnston	L. B. Doecke
Sutherlands	7/5/36	13	" Care of Farm Machinery" —A. M. Twartz	L. B. Doecke
Brownlow	6/5/36	14	" Economics on a Farm " —G. H. Roocke	V. G. Semmler
Hanson	5/5/36	48	Address—Dr. A. R. Callaghan	M. de N. Lucas
Whitwarta	18/5/36	24	" Pigs and Bacon Curing " —W. H. Hoepner	C. W. Dunow
Wasleys	7/5/36	17	" Hints on the Farm "—V. W. Day	C. R. Currie
		YORKE PENINSULA DISTRICT.		
Weavers	11/5/36	16	" Worms in Sheep "—Mr. Butterfield	H. W. Cornish
Boor's Plains ..	7/5/36	20	" Fencing "—S. G. Chynoweth	S. G. Chynoweth
		WESTERN DISTRICT.		
Palabie	30/4/36	12	Discussion	A. E. Place
Nunjikompita ..	30/4/36	6	Annual Meeting	S. R. Morgan
Pinbong	2/5/36	17	Discussion—" Feeding Young Pigs "	D. O. Scholz
Balumbah......	5/5/36	9	" Travelling "—A. A. Jericho	J. E. Swann
Kelly	2/5/36	15	Formal Business	F. R. Illman
O'Loughlin	7/5/36	14	" Sheep on the Farm "—Hon. Sec.	E. R. Pfeiffer
Laura Bay	14/4/36	19	Address—Mr. Collins	P. S. Morrison
Taragoro	7/5/36	6	" Crop Rotation in New Mallee Country "—A. Crabb	T. Winters
Goode	6/5/36	13	Discussion	B. A. Linke
Green Patch ...	7/5/36	14	" Farm Blacksmithing "—S. Baillie ; " Superphosphate "—B. Ritchie	C. J. Whillas

SUMMARY OF REPORTS RECEIVED—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
		WESTERN DISTRICT—*continued.*		
Pygery	5/5/36	7	Discussion—" Tree Planting "	A. Day
Warramboo	8/5/36	5	" Livestock "—O. J. Murphy	P. E. C. Daniel
Warramboo	18/4/36	—	Annual Social	P. E. C. Daniel
Roberts and Verran	4/3/36	10	Address—H. D. Adams	C. M. Masters
	1/4/36	10	" Wheat Varieties "—C. M. Masters	C. M. Masters
Roberts and Verran	13/5/36	9	" Farm Forestry "—A. T. Cowley	C. M. Masters
Kyancutta	7/4/36	6	Formal Business	E. A. Kelly
Kyancutta	5/5/36	13	Discussion—" Dry Seeding "	E. A. Kelly
Koppio	6/5/36	12	" Care of Harness "—F. Gardner	M. T. Gardner
Miltalie	12/5/36	9	Combined Meeting with Mangalo A.B. " Value of a Field Engineer for E.P."—W. Smith	S. D. Ramsey
Butler	11/5/36	11	Question Box	C. F. Jericho
		EASTERN DISTRICT.		
Yurgo	27/4/36	14	Annual Meeting	H. M. MacKenzie
Coomandook	24/4/36	6	Discussion	W. R. Trestrail
Ramco	4/5/36	6	" Fishing on the River "—A. Modistach	J. J. Odgers
Berri	18/5/36	15	" Care of Orchard Implements "—P. M. Wilksch	E. J. R. Johnson
Devlin's Pound	18/5/36	15	Address—C. A. Goddard	H. A. Loffler
Nunkeri	5/3/36	7	Discussion	E. R. Peltz
Nunkeri	29/4/36	170	Address—W. J. Spafford	E. R. Peltz
Nunkeri	20/5/36	13	Address—C. A. Goddard	E. R. Peltz
		SOUTH AND HILLS DISTRICT.		
Yundi	22/4/36	16	" S.A. Softwoods "—A. J. Adams	J. J. Guiney
Springton	1/4/36	7	Annual Meeting	P. L. Miller
Cherry Gardens	2/5/36	10	Homestead Meeting at J. C. Blakely's	A. R. Stone
Frayville	5/5/36	14	Address—C. A. Goddard	H. H. Ramm
Ironbank	6/5/36	15	Address—H. C. Trumble	C. M. Morgan
Hartley	6/5/36	12	Papers by H. S. Stanton and C. Brook	W. J. Brook
McLaren Flat	7/5/36	40	Visit to Mount Bold	W. Kyloh
Meadows	5/5/36	20	Business Meeting	E. W. Young
Springton	6/5/36	10	" Care of Farm Utilities "—P. T. Miller	P. L. Miller
Echunga	13/5/36	9	" Care of Livestock "—A. W. Cobbledick	L. H. Walters
Carey's Gully	11/5/36	7	Discussion—" Apple Growing "	L. Neighbour
Blackheath	7/5/36	7	Paper from Victorian *Journal*	E. H. Paech
Hope Forest	4/5/36	15	" Ailments of Cows "—Mr. Angove	H. J. Hunter
Mount Barker	18/5/36	—	" Wool Scouring "—Mr. Bradley	P. Wise
Yundi	20/5/36	17	Address—A. E. Osborne	J. J. Guiney
Monarto South	16/5/36	20	" Fallowing "—T. Peake	C. F. Altmann
Inman Valley	21/5/36	15	Annual Meeting. " Lessons from 1935 "—J. S. B. Martin	S. F. Hacklin

WOMEN'S BRANCHES.

"Women's Branches of the Agricultural Bureau continue to gain in popularity amongst country women," reported Mr. F. C. Richards (Asst. Secretary of the Agricultural Bureau) when he opened a Women's Branch at Koolunga on 6th May, bringing the total number of Branches to 62 with the fine total membership of 1,439. The Koolunga Branch elected the following officers:—President—Mrs. S. Perrin; Vice-President—Mrs. E. D. Whitehorn; Secretary and Treasurer—Mrs. A. Buchanan; Members of the Committee—Mrs. W. Sykes, Mrs. F. Pedler. The following ladies were enrolled as Foundation Members:—Mesdames T. Cameron, W. Sykes, E. Fuller, E. Butterfield, A. Buchanan, H. Spencer, R. Bentley, S. LePage, F. Pedler, S. Perrin, A. Bentley, — Button, A. Whitehorn, R. Hauesler, D. Cooper, A. W. Mueller, C. Longmire, C. Binford, M. Brown, H. Jones, L. Lange, E. Spencer, Misses L. Pedler and M. Pengilly. It was decided that meetings of the Branch should be held on the third Thursday of each month.

GARDENING FOR PLEASURE.

[Mrs. B. D. E. Bottrill, Bordertown.]

One of the most pleasant hobbies and one which will give most interesting results, whether it be flowers or vegetables, is gardening.

Lawns.

Practically everyone who has their own home and plans their own garden is undecided as to what kind of lawn to put in. For a croquet or tennis lawn I recommend Couch Grass. This grass stands up to heavy use, and with plenty of watering, mowing, and rolling makes an ideal lawn. Seed should be sown at the rate of 1oz. to the square yard. Sown with bone super in early August it will make good headway the first summer. For a lawn which is not expected to stand up to hard usage I suggest Buffalo Grass. This should be planted in rows 9in. apart, and the roots 6in. apart in the rows. A Buffalo lawn when established requires top dressing each year with a dressing of bone super first, then over that fine loam. This should be done towards the end of July or early August. For a lawn to beautify the surroundings I recommend Chewing's Fescue and Kentucky Blue Grasses. The mixture is 1lb. Kentucky Blue and 2lbs. Chewing's Fescue to be sown 1oz. to the square yard. From early August this grass mixture will give an evergreen lawn of a rich, deep green, and once established will be found most effective in the flower garden.

Shrubs.

The selection of shrubs is important in planning a new garden, as the future effect must be taken into consideration. By all means plant a few shrubs; they not only relieve the flower garden from flatness, but are ornamental and serve the purpose of shelter for both the residence and the flower beds. Many gardening enthusiasts prefer flowering shrubs, particularly of an evergreen type, in preference to deciduous shrubs—those that shed their foliage in autumn. The following are worth a place in the garden of the average class of soil:—

Shrub.	Height.	Colour of Flower.
Abelia,	5ft.,	pale pink.
Plumbago,	8ft.,	blue.
Tecoma Capensis,	8ft.,	red.
Tecoma Lindleyana,	6ft.,	lilac.
Virgilia Capensis,	30ft.,	purple and white.
Buddlea Veitchi,	8ft.,	purple.
Nerium (Oleander),	10ft.,	red, pink or white.
Sparmannia.	10ft.,	double white.
Laurustinus,	10ft.,	white.
Myrtus (Myrtle),	10ft.,	creamy white.
Hisbiscus Lamberti,	5ft.,	scarlet.
Podalyria.	6ft..	pink.
Cassia,	6ft.,	yellow.
Pollalyria,	6ft.,	pink.
Euonymus Japonica,	10ft.,	variegated foliage.
Pittosporum variegata,	10ft.,	variegated foliage.
Genista fragrans,	5ft.,	yellow.

The above list of shrubs can be depended upon to give good results in the usual class of soil. One shrub which should have a place in every garden is the Geraldton Wax plant. This plant requires no rich soil or cultivation, prefers a sandy loam, and very little water. In fact many who have tried it have killed it with kindness—too much water and manuring. It prefers to be left undisturbed once it has been established in its new surroundings.

Hedges.

What is the best hedge to plant? Undoubtedly the best is *Cupressus Lambertiana* for all classes of soil. This is close growing, evergreen, and stands a good deal of trimming. Once the variety is established little or no watering is required during summer. Some prefer *Coprosma* as a hedge, but unless this receives plenty of water during summer it will certainly not give results expected. A very pretty, compact hedge may be had by planting Plumbago (blue) or *Tecoma Capensis* (red). Both these varieties—apart from bright flowers—are evergreen, and will stand a good deal of trimming. For a hedge of, say, 5ft., Golden Privet is recommended. This is very compact, and with plenty of trimming makes an ideal hedge. For an ordinary windbreak I have seen *Spartium junceum* (Yellow Broom) put to very good use. With its dark-green foliage and bright yellow flowers it is very effective, but is inclined to become "woody" unless cut back occasionally.

Annuals.

It would require many pages to deal with all the annuals known to the seedsman, but one of the most popular is the nice variety of Stocks. These prefer a light soil if possible; they also flourish on new ground, but on no account should manure be dug in where Stocks are to be planted. This tends to cause "collar rot"; the plants may look well for a while, then suddenly they droop, turn yellow, and the only thing to do is pull them out. This is the result of too much manure; this will also occur to Antirrhinums (Snapdragons).

Another annual very popular is Nemesia; the shades are pink, red, orange, yellow, &c. A bed of these make a splendid display.

Godetia Tall Double Mixed are worthy of space, are splendid for cutting, and require sunshine and little water.

Viscaria (blue) is easy to grow, and a bed or border of this with its lavender-blue flowers will make a good display.

Wallflower Double Annual Mixed if planted in autumn, flower in spring, and at the end of summer may be cut right back; they will then flower again in winter.

Antirrhinums are favourites with most people; such a wonderful range of colour may be had nowadays, although an annual Antirrhinum gives a wonderful show of flowers the second season if cut hard back at the end of summer.

Larkspurs Double Mixed.—This is the "Annual Delphinium." They are excellent for cutting, and give a wonderful show of bloom—especially the variety known as "La France," a salmon pink—but the mixed varieties of the Double Larkspur are well worth growing.

Phlox.—These bright annuals will give excellent results if planted out in late autumn. They will then flower from the first sign of spring until late summer.

Zinnias.—Three outstanding varieties of this showy summer annual are Giant Dahlia Flowered, Giants of California, and "Fantasy." The last mentioned is the latest introduction. There is a splendid range of colours, and the flowers themselves are not unlike a Cactus Dahlia, the petals being curled and twisted. Well worth growing.

Cinerarias are becoming very popular, both as a shadehouse plant and also for bedding. Wherever it is possible to grow these under trees as a shelter from frost they make a splendid show, and for this purpose give the ground a good dressing of poultry manure. This should be dug in and the Cinerarias planted 1ft. to 18in. apart, and for late winter flowering they are the brightest patch in the flower garden. Cinerarias are really a perennial, but are best treated as an annual. They are not difficult to grow, and for the brightness of their flowers are worthy of a trial.

Sweet Peas.—The winter-flowering varieties are the most popular; they give plenty of blooms for table decoration when flowers are scarce. Give the ground a good dressing of poultry or rotted cow manure; dig this in as deeply as possible; make a shallow trench, say, 4in. to 6in. deep; then sow the Sweet Pea seeds 1in. to 2in. deep and 12in apart. When growth is well advanced and signs of flower buds appear give them a watering with sulphate of ammonia. To do this a dessertspoonful of sulphate of ammonia should be dissolved in 1gall. of water, and this should be poured in the trench by watering can (without rose) as far as it will go, at the same time giving the Peas a good drink. This may be done twice weekly or every fourth day. Soot water is also beneficial to Sweet Peas. Both the above bring out the colour in the blooms more richly. A little extra attention in this way will repay you with much better class flowers.

BACON CURING.

At the April meeting of the Snowtown Branch the following paper was read by Mrs. A. Dolling:—Select a pig of about 180lbs. to 200lbs. dressed weight; a well fed Large White or Tamworth-Berkshire cross should weigh that at about eight months old. Next, a very cold night is essential for killing; if the carcass is not properly cold it will not keep. The carcass should be cut down the middle of the back while still hanging up, as it is better to handle for carrying inside.

Place on a table and cut each half into three pieces, first just past the shoulder blade and then close to the hind leg; the shoulder may be cut into convenient joints for roasting or pickling as desired, but cut off any surplus fat, which can be rendered down for the lard tin, which comes in very handy for cooking.

Next, take a round-pointed butcher's or working knife and cut the ribs off the bacon, being very careful to cut quite close to the ribs and not dig holes into the bacon. Trim the bacon; it will be much thicker on the backbone side than the bottom, so remove some of the lean meat to make it almost the same thickness all over. If left on the bacon that lean meat becomes very dry and hard when smoked. If it is cut off it comes in very handy for metwurst. Trim the ham into a nice shape and cut out the pelvis bone. Here again, care must be taken to cut very close to the bone or there will be an unsightly, gaping hole in it.

Have ready a clean pickling cask in a cool place. Make a brine of 2lbs. salt, 1oz. saltpetre, and ½lb. white sugar to every gallon of water; it takes about 8galls. or 10galls. of brine for pickling. Dissolve salt, etc., in cold water. The best method is to make about 3galls. of brinc at a time and put on the meat as it is ready. Put about 2galls. of brine in the cask, then put in hams first, then bacon; if possible, the ham's should fit alongside each other at the bottom of the cask. On top of the bacon, the pickling meat may be placed. Now pour on the brine until the meat is completely covered and cover with hessian to keep out flies, but it should not be too airtight. Hams and bacon should be taken out and turned once a week. Leave in brine for four weeks, then take out and put in a tub of cold water, soak for 24 hours, take out, press hams into shape, wipe with dry cloth and give a good sprinkling of pepper. Hang up to dry for a day of two before smoking.

Metwurst.—16lbs. meat, not too lean (about one part fat to five lean), 6ozs. salt, 1oz. pepper, ½oz. saltpetre, 3ozs. suger. Put meat twice through mincer, then add salt, pepper &c., and mix well. The saltpetre must be finely powdered to press through a fine sifter. Fill into skins and hang up for a day and smoke. Be careful not to get too hot. The meat for metwurst should be of the best and free from blood. The head should be carefully cleaned and cut in halves and soaked in cold water all night. Next morning, boil for about two hours with all the scraps from trimming.

White Pudding.—One part cooked liver, two parts fat, salt, pepper, cinnamon, and a small onion cut very finely and fried in fat until cooked without browning. The rest of the head and scraps should be minced and mixed with one cup of rice (before it is boiled). Boil in plenty of water until cooked, cut a few slices of stale bread into cubes, and pour on boiling water, enough to just soften. Add salt, pepper, pimento, majoram, and thyme to taste. When well mixed, put into baking tins and bake for about three-quarters of an hour in moderate oven. This will keep for more than a week and is very nice, if fried with eggs instead of bacon, for breakfast. If liked, it may be eaten cold or used in sandwiches for lunches.

DYEING.

Paper read by Mrs. C. Hancock at the April meeting of the Parrakie Branch:—

Always choose a good drying day with a slight breeze. Make the dye beforehand as directed on the packet. I make the dye and bottle it. It saves time to keep a bottle of dye handy, especially if tinting is done after washing day, for most colours fade with sunlight and washing. To get a pastel shade, pour a few drops out of the dye bottle into a small pan of water and use as a rinsing water last of all. Most of these suggestions are for silks, satins, or cotton goods, and to make a colour fast it is necessary to boil the materials. Do not boil woollen goods or silks; the former should have a lukewarm dye. Pretty shades can be made by mixing two or more dyes together—red and blue make a purple, or a little more red than blue will make the new "plum shade"; blue and yellow will make certain shades of green; red and yellow make orange; pink and blue (pale) make a lilac tone.

Do not forget to have plenty of salt in the water or dye bath, this helps to set the colour. Always have a piece of the material to experiment with before attempting to dye the material. When making the dye always stir well before putting in the material, and also add the salt at once. Another method is to stand the material in the dye for several days, and lift in and out of the water now and again to prevent streaks. Always remove all ornaments such as buttons, &c., as these articles will change colour, especially if boiling dye is used.

Rinse finally in clear rainwater until the colour runs clearly. I always add salt to this also, and be very careful about putting out on the line. Never wring the materials, but lift in and out of the dye bath and hang straight on the line soaking wet. When it is drying turn upside down. When almost dry press, and for a tweed material press into shape again with damp cloths.

COOKING COMPETITION.

The March meeting of the Millicent Branch took the form of a Cooking Competition, and was particularly well attended, between 80 and 90 being present, including visitors from the Coonawarra, Kalangadoo, Tantanoola, and Rendelsham Branches. Mrs. R. Oberlander (President) occupied the chair, and extended a welcome to the visiting ladies. During the afternoon, a pianoforte solo was rendered by Miss Foster, and Mrs. W. E. Willshire contributed a recitation. A competition was keenly contested. Great interest was taken in the Cookery Competition, and entries were numerous for most classes. Messrs. G. and A. H. Millhouse had no light task in making the awards. A 25-lb. bag of flour presented by the Golden Crust Company was won by Miss Kathleen Ey. The awards were as follows:—Pound cake—Miss J. Telfer, 1; Mrs. H. J. Hutchesson, 2. Sultana cake—Mrs. H. Edgcumbe, 1; Miss D. Osborne, 2. Sponge sandwich (under 21)—Miss Joyce Fensom, 1; Miss Gwen McIntyre, 2. Sponge sandwich (open)—Mrs. H. Edgcumbe, 1; Miss D. Osborne, 2. White scones—Mrs. H. Edgcumbe, 1; Miss K. Ey, 2. Date scones—Mrs. H. Edgcumbe, 1; Mrs. Graham Major, 2. Collection of pastry—Mrs. Thompson, 1 and 2. Collection of biscuits—Mrs. H. Edgcumbe, 1. Ribbon cake—Miss O. Lear, 1 and 2. Lamingtons—Miss M. Bennett, 1; Miss I. Fensom, 2. Cream puffs—Mrs. H. E. Holzgrefe, 1 and 2. Queen cakes—Miss O. Lear, 1 and 2. Coffee cake—Miss I. Fensom, 1; Miss M. Bennett, 2. Pasties—Mrs. R. Elton, 1 and 2. Scones made with Golden Crust self-raising flour—Miss K. Ey, 1; Mrs. R. Elton, 2. A pleasant and instructive afternoon concluded with the serving of afternoon tea, at which the members of the men's branch were entertained.

DISPLAY OF WOMEN'S HANDICRAFTS.

The April meeting of the Coonawarra Branch took the form of an "Exhibition," a display of women's handicrafts. An instructive afternoon was spent inspecting the large collection of very fine articles brought along for exhibition by members. Amongst the articles exhibited were knitted garments, various types of cushions, jug covers, duchess sets, table centres flowers made from wood pulp, dolls, crocheting, needle work, wood and basket work, various preserves, baking, also vegetables and fruit. Beautiful ancient china from far off countries was displayed by Mrs. and Miss Soper, some articles being purchased over 40 years ago from overseas. Much interest was also shown in two old coins belonging to Mrs. L. Teichelman.

A seasonable gardening talk was given by the President, Mrs. H. A. Beschke.

Twenty members and three visitors attended the meeting held on 3rd April, when an address, "The Making and Baking of Cakes," was given by Miss Ellie Campbell, Inspector of Domestic Acts, of the Education Department.

HOUSEHOLD HINTS.

Devlin's Pound.

The following were given by Mrs. J. L. Loffler at the meeting held on 24th March, which was attended by 10 members and 18 visitors.

Modern liquid cleaners are very labour saving. They do their work efficiently with very little personal energy or elbow grease. But there are other humble liquids that prove a great help in the running of a home.

(1) *Ammonia.*—This is a particularly useful article, no housewife should be without a bottle. If used when washing woollens and blankets it loosens dirt and softens the water. It is not advisable to use it for coloured woollens unless the shades are quite fast. A dull looking rug or carpet will show considerably brighter colours if washed over with a pail of warm water to which 2 tablespoons of ammonia are added. Hair brushes should be rinsed in water to which 1 teaspoon of ammonia has been added. In addition, ammonia will help to cleanse china, polish glass, and will speedily remove all grease from plates and dishes. Ammonia added to the bath water is most refreshing and will leave no "tide mark" around the bath.

Methylated Spirits.—This is another labour saving liquid. There is nothing quite so good as methylated spirits for cleaning windows and mirrors. Silver which has become tarnished can be cleaned in half the time if it is first rubbed over with a soft rag dipped in methylated spirits. If a little is added to rinsing water for white silk jumpers, blouses, frocks, or undies, there is less likelihood of them becoming yellow. Removing perspiration marks from silk is always an awkward problem, but it can be solved by putting the affected parts into a mixture of methylated spirits and ammonia for a few minutes. Afterwards wash well and the stains will be removed.

Kitchen Hints.—An old catalogue on the kitchen table is handy; on it can be placed any hot pots, and thus saves the oilcloth. Tear off the dirty page and continue until the book is used.

Tea towels and dishcloths will keep a good colour if aluminium saucepans are not put on an open fire. If they are put on the open fire the bottom should first be greased, and then before washing, this can be easily removed with a piece of old newspaper.

A lemon is almost indispensable in the kitchen. It takes stains from the fingers after peeling fruit and vegetables. Taps rubbed over with a lemon takes less polishing. Knife handles also can be cleaned.

The mincing machine can be used for grating candied peel; this saves time spent in chopping or slicing.

Warm to hot water removes grit, sand, and dirt from vegetables more quickly than cold water.

Unwanted pieces of cardboard when cut into strips make good kindling.

If troubled with watery eyes when peeling onions, hold them under water and peel from root to stem.

Laundry Hints.—Bloodstains should be soaked for ½ hour in lukewarm water to which a little salt has been added. Grass stains can be removed from silks by sponging with ammonia and water. New stockings should always be soaked in lukewarm water to which has been added 2 tablespoons of salt. Then squeeze out and dip them into warm soapy water. A small piece of soap dropped into the starch after the boiling water is added will prevent the iron from sticking. Powdered starch applied quickly to fruit stains on linen will often remove the marks. Let the starch remain on until it has absorbed the discolouration, then brush off and wash linen in usual way.

General Hints.—Vinegar and water will clean gilt picture frames. Furniture first rubbed over with a cloth dipped in vinegar and water will make polishing far easier, and no finger marks will show.

Kybybolite.

[Meeting held 10th March.]

To keep silver clean, after the usual washing, place in an aluminium saucepan with a piece of common soap, and pour in boiling water; dry quickly, and polish with velvet or chamois.

To save carpet or lino. near telephone, place mat made cheaply from a sugar bag, ornamented with strips of raffia.

To save constant re-papering of shelves in safes or dressers, use strips of lino.

To make stoves (old) keep the polish, use a mixture of bluestone and black lead.

Paint brick fireplaces with enamel (brown), to save constant cleaning.

To dust moquette furniture, cover with damp cloth and beat.

Wash lino. with a cloth dipped in stale milk, to prevent slipperiness.

Wipe inside of kitchen windows with a cloth moistened with a few drops of glycerine to prevent steaminess.

Save charcoal from fires to moisten with a few drops of kerosene or waste oil, and use for lighting fires in the mornings (a large spoonful is sufficient).

To remove stains from enamel bath, rub with a mixture of turpentine and a little common salt.

CASSEROLE COOKING.

Miss M. Mattiske read the following paper at the Pinnaroo meeting, held on 3rd April:—

Casserole cooking is the most savoury method of cooking, as food cooked in the glass or stoneware dishes retains all its flavour and nourishment. Very little stock or water should be used, as fish, meat, or vegetables cooked in casserole should cook in their own steam. A tight-fitting lid is essential. The casserole has many advantages over ordinary cooking utensils.

The cooking process, though slower, requires very little attention. All food values are retained, except vitamins. It always looks clean and attractive; food cooks more evenly in it; it can be served in the dish it which it is cooked; and last, but by no means least, "washing-up" is minimised.

Fruit of any kind can be stewed in the casserole, and cooked at the same time as the roast, thus saving fuel and washing-up. Vegetables suitable for cooking in casserole are peas, beans, Brussels sprouts, marrow, cauliflower, potatoes (new and old), carrots, turnips, onions, and parsnips. Cabbage and spinach are not suitable for casserole cooking.

Casserole of Fruit.—Fruit, sugar, a little water, and flavouring. Peel the fruit, remove stones or core, and cut into slices. Boil the required quantity of sugar and water together for 1 minute, pour over the fruit, cover with lid, bake in a slow oven until fruit is soft; serve hot or cold. Apples may be cooked either sliced or whole, adding lemon rind or cloves as flavouring; pears, whole or sliced, adding lemon rind, cloves, or ginger as flavouring; quinces, whole or sliced.

To Cook Vegetable in Casserole.—Prepare vegetable in usual way; place in casserole, sprinkle with a little salt; add a pinch of carbonate of soda; if green vegetable, pour over about 1 cup of water (cold or hot); cover with lid; place in oven 25min. to 40min. before the roast is to be dished; drain off all liquid, and serve in the dish in which it was cooked.

Casserole of Liver.—One lamb's fry, carrot, turnip, onion, flour, fat, water or stock, rashers of bacon, parsley, salt, and cayenne. Soak liver in cold, salted water for 20min. Peel the vegetable, and cut in large dice. Melt the fat, and fry the vegetable for a few minutes. Remove from fat, and place in casserole. Wipe the liver dry; cut in slices, dip in flour, and fry in the fat until browned. Drain well, and place in casserole on bed of vegetables. Add some flour to the fat, allow to brown; add water, and stir till it boils and thickens; add salt and cayenne. Strain over liver, add the bacon, cut into strips; cover with lid; place in a moderate oven, reducing heat after 10min. Then cook slowly until liver is tender. Add more liquid, if necessary; remove any fat from the top of the stew with a spoon, then paper; sprinkle with chopped parsley, and serve at once.

Savoury Casserole.—2lbs. topside steak, 1 onion, carrot, salt, pepper, rasher of bacon, Worcestershire sauce, tomato sauce, vinegar, parsley, and a little stock. Lay steak in casserole, grate carrot and onion, mix the sauces, vinegar, stock, salt and pepper well together, add onion and carrot; pour all over meat; stand for 10mins.; cover with lid; place in a moderate oven, and cook slowly for about 1 hour. Remove all traces of fat, sprinkle with chopped parsley, and garnish with rolls of bacon.

Chicken en Casserole.—1 chicken, 2 small onions, 4 slices of fat bacon, salt, pepper, a little flour, stock or water, mushrooms (if liked). Cook the giblets slowly in water until tender, and use the liquid as stock. Lay two rashers of bacon in a well-greased casserole; sprinkle with finely chopped onion and mushrooms; lay in the seasoned chicken, put remainder of bacon on top; sprinkle in a little flour, add the stock, cover with lid; bake in a slow oven until tender; serve very hot.

Steak and Tomato Casserole.—Topside steak, 2 onions, 4 large tomatoes, salt, pepper, a little water, flour, fat. Cut steak in neat pieces, and fry in fat until brown; drain, and place in casserole. Add flour to fat, with salt and pepper, and brown evenly. Cut onion and tomatoes into slices, and lay on steak. Pour over hot gravy; cover with lid, and bake in slow oven from 1 to 1½ hours. Serve very hot, sprinkled with parsley.

THE KITCHEN GARDEN.

Eleven members attended the meeting of the Mudamuckla Branch held on 18th March, when the following paper was read by Mrs. Reincke:—The first point to consider is the site for the garden. On the side of a hill is best; the soil is not so hard as that in the flats, and it can be more easily got into working order. If the land is inclined to be hard apply a few loads of sand and add plenty of stable manure. The garden should be well fenced on the north, west, and south sides to protect the vegetables from strong winds. If artificial manure is to be used sprinkle it lightly among the plants when growing, hoe, and water thoroughly. If possible have the garden near the house, then the men can do the digging. Another advantage of this location is that the vegetables can be brought in just as they are wanted for use, and one has more chance of keeping birds away. Before any seeds are put in be sure they are good, or this will make late crops. Use fresh seed each year. If the best cabbage or cauliflower goes to seed save it for sowing next year. It is advisable to have both early and late varieties of all crops so that vegetables of some kind will be available all the year round. Turnips and swedes grow quite well in the paddock. Always plant seeds in tins or boxes in a sheltered place until they are up, and gradually move them out until they get plenty of sun, and they will be hardened off ready for planting out. Several weeks before transplanting sprinkle well with sulphur to check any pest. Do not plant seeds in too rich a soil.

After the beds have been dug and well aired and manured choose a dull day or evening for setting out the plants. Where there is a small family do not put out a lot of plants at once; it is better to plant just a few each month so that they will not all be ready at once. Carrots, parsnips, and red beet mature a fortnight or so earlier if not transplanted. Plant these where cabbages, &c., have been grown, but see that the land is dug well and no manure added, because the latter tends to make "forked" vegetables.

It is advisable to have the beds banked up around the edges if trenches are not used, to be able to give the ground a good watering. Two good waterings a week in summer are better than a sprinkling every morning or evening. Most root vegetables can be grown all the year round; the summer here is almost too hot for any green crop except silver beet unless grown in a nice shady place.

Put in tomato seed no later than July or August so that the plants can be set out in September. Most of the danger of frost is then over, and should there be a frost and they are not covered, sprinkle water over the plants before the sun gets on them. Put in melons, cucumbers, pumpkins, &c., during September and October. These unfortunately do not set well until January or February. If there are no bees or ants about, pumpkins and vegetable marrows have to be inoculated. This is best done early in the morning before the flowers droop. Always try to trellis tomatoes; it keeps the bushels more healthy, and the fruit does not rest on the ground. If pruned, crops will be heavier, and the fruit will be more even in size.

Pumpkins, melons, &c., are grown very much alike, and once they get a start need very little attention. If the wind affects them put down some boughs for them to creep on to. Do not throw away soot from the stove, sprinkle on the carrots and onions, and water well. Rhubarb grows well with plenty of water and manure. Celery, too, can be grown easily if it is only used for flavouring. Beans do not do very well unless well sheltered. North winds cut them badly. However, the Seven-year Bean and the New Guinea Butter Bean are all right if protected from frosts. Peas give satisfactory crops without much attention if a dwarf kind is grown. Kohl Rabi also does well, and can be used several ways. All winter seeds should be sown early in March so that they will go ahead when the first rain comes.

Remember when cooking vegetables all that is grown above ground cook in boiling water, and all that is ground under ground put into cold water.

Varieties to Grow.—Red Beet—Obelisk, or Turnip-rooted; Silver Beet—Curly Leaf; Cabbage—Earliball, or Succession; Cauliflower—Early Eclipse; Carrot—Early Horn, or Chantenay; Parsnip—Hollow Crown; Cucumber—Apple-shaped, or Crystal Apple; Kohl Rabi—Large Purple; Lettuce—Iceberg, or Imperial; Onion—Early Barletta, or Brown Spanish; Tomato—Early Dwarf, or Navel King; Pumpkin—Queensland Blue; Melon Pie—Citron; Melon, Water—Ice Cream, or Sugar Stick; Turnip—White Stone; Swede —Purple Top.

ICING AND DECORATING A BIRTHDAY CAKE.

[Paper read by Mrs. A. Kloeden, at a meeting of the O'Loughlin Branch, on the 5th March, 1936.]

When the cake is intended for an adult, most of us like to be given a free hand with rich ingredients; small children are naturally better suited with fairly plain cake of the Madeira type. As long as the icing and decorations are above reproach, no child thinks twice about the comparatively plain cake beneath. A rich fruit cake is stored as a matter of course for some weeks before the appointed birthday. It is unwise to ice a cake of this type until a few days before it is needed, as the royal icing becomes brittle and difficult to cut.

There is always the chance of the icing becoming discoloured through lengthy contact with the moist, fruity cake, and a yellow blotched icing is certainly not attractive.

The first coating of the cake should be of almond icing. As ground almonds are very seldom procurable in our country stores, and are fairly expensive, I use the coconut icing, which consists of whites of 2 eggs 1 cup of desiccated coconut and 1lb. icing sugar. Stir well together in a thick paste. For ease in handling the cake you will find it a good plan to stand the cake on an upturned soup plate. Lift the whole thing to a convenient working height by placing it then on an upright jar of some kind. You will be able to turn this as required, without touching the cake.

When putting on the first coat of coconut icing brush the cake free of all crumbs with a damp cloth dipped in hot water. Keep the cake moist whilst putting on the icing and let it stand till next day.

Next comes the royal icing, which gives the smooth, firm surface so necessary for icing decorations. *Royal icing*—1lb. icing sugar, 2 egg whites, a few drops of lemon juice, a few drops of wash blue, and a few drops of glycerine.

Each ingredient plays an important part. The egg whites, used instead of water or milk, give the full characteristic firm texture to the icing. Lemon juice is mere flavouring, but the glycerine prevents the icing becoming over-brittle. A few drops of washing blue are indispensable when a pure white icing is required; both the blue and glycerine are tasteless and harmless.

Use a broad, pliable knife and ice the sides first, working any surplus icing up over the top edges. Next place a little icing on top of the cake and smooth it carefully to the edges. To obtain the smooth, shining effect, dip the knife in a deep jug of boiling water, shake it free of surplus moisture and smooth it carefully over the icing. Then let it stand till next day. Then comes the really interesting part of the work. So far all cakes are more or less alike, but with the decorating every woman can carry out her own ideas to produce something beautiful, original, or even definitely amusing. The modern metal icing pump makes the work very simple (though I prefer the rubber icing bags and tubes). With its aid you can make straight lines, lettering, scrolls and roses, and all manner of decorations.

Colour plays a big part in some designs, and touches of pink or green and silver cachous can be used most effectively.

If the design you fancy is beyond your drawing powers, there is still a way out. First find the required illustration and draw or trace it on white paper. Then lay the paper on the hardened surface of the cake, and with a needle prick it through on to the icing. It is then a simple matter to follow the dots with the thread of the icing from the tube. You will see many possibilities in this method.

SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			WOMEN'S BRANCHES.	
Yurgo	27/4/36	—	Annual meeting.........	Mrs. R. E. Sanders
Monarto South .	25/4/36	16	"Dressmaking"—Mrs. E. A. Thomas	Mrs. F. W. Liebelt
Morchard	29/4/36	19	Formal business	Miss. F. A. Brown
Penola	1/5/36	50	"Fancy-work"—Miss Marks	Mrs. F. J. Kidman
Sheoak Log	7/5/36	50	Visit by Wasley's Branch	Miss K. M. Koch
Wepowie	4/3/36	7	"Uses of Tomatoes"—Hon. Sec.	Miss E. Roocke
Rendelsham ...	6/5/36	10	"Soups"—Mrs. F. Todd, sen.	Mrs. W. Bignell

SUMMARY OF REPORTS RECEIVED—*continued*.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
WOMEN'S BRANCHES—*continued*.				
Pinnaroo	1/5/36	14	"Knitting"—Mrs. Sampson	Miss N. Mattiske
Wepowie	6/5/36	11	Address and recipes—Mrs. Orrock	Miss E. Roocke
Auburn	30/4/36	23	Visit from Saddleworth Branch, Travel Talk—Miss G. Frost	Miss L. J. Dennison
Echunga	6/5/36	17	Address—H. H. Orchard	Mrs. F. Dennis
Balumbah	6/5/36	11	Impromptu speeches	Miss H. D. Jericho
Hope Forest	7/5/36	8	"Care of Children"—Mrs. Wollaston	Miss M. E. DeCaux
Devlin's Pound	22/4/36	9	"Paddock Lunches"—Mrs. E. Doig	Mrs. J. L. Loffler
Mangalo	13/5/36	8	"Trip to South-East"—Mrs. O. E. Hannemann	Mrs. F. Coles
O'Loughlin	8/5/36	14	"City *v.* Country Life"—Mrs. J. Foggo	Mrs. E. E. Lutz
Wilmington	14/5/36	19	Paper from *Journal*	Mrs. P. Cole
Pinbong	2/5/36	15	"The Pie Melon"—Mrs. N. George	Miss D. M. Scholz
McLaren Flat	14/5/36	11	Election of officers	Mrs. B. Powell
Belalie	19/5/36	35	Discussion—Home and Garden "Girls should leave Home"—Mrs. M. N. Bailey	Mrs. E. L. Orchard
Warramboo	8/5/36	15	Knitting display "Knitting"—Miss E. Steer and Mrs. Daniel	Miss J. P. Patterson
Georgetown	13/5/36	27	"Quilting and Pottery Making"—Mrs. E. L. Orchard	Miss J. Crawford
Beetaloo Valley	4/5/36	12	"Woollen Manufacture"—Miss Giddings "Citrus Fruits"—Miss Jean Halse	Mrs. E. A. Pearce
Warcowie	5/5/36	8	"Music in the Home"—Mrs. L. Jarvis "Dried Fruits"—Mrs. R. A. Jarvis	Mrs. A. G. Avery
Millicent	15/5/36	8	"The Art of Dress"—Hon. Sec.	Miss K. Hutchesson
Laura Bay	12/5/36	12	"Trip to Eastern States"—Miss Gladys Lowe	Miss T. E. Barnett
Balhannah	20/5/36	—	"Poultry"—Mrs. Robinson	Mrs. W. Camp
Gladstone	19/5/36	—	Handicraft competition	Mrs. L. J. Sargent
Monarto South	16/5/36	16	Household hints	Mrs. F. W. Liebelt
Tantanoola	6/5/36	13	"Rugs and Mats"—Mrs. Altschwager	Mrs. Gus Altschwager
Wilkawatt	19/5/36	30	"Helping our Children"—Mrs. A. Young	Mrs. W. M. Pritchard
Kangarilla	21/5/36	12	Annual meeting	Mrs. C. Steer
Boor's Plains	7/5/36	14	"Fancy Cooking"—Miss A. Cross	Miss L. Stanway
Strathalbyn	21/5/36	17	Question Box	Mrs. C. M. Hudd
Wirrabara	21/5/36	30	Visit from Belalie Members	Mrs. E. Harding
Mudamuckla	4/5/36	16	"Care of Teeth"—Sister Ling	Mrs. C. H. Kuhlmann
Myponga	25/5/36	10	"Butter Making"—Mrs. Summers	Mrs. M. Bounds

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All communications to be addressed:

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, 1936.

Eyre's Peninsula (East), at Kimba (Kelly Branch), Tuesday, 4th August (Mr. F. R. Illman, Box 64, Kimba).

Southern, at Inman Valley, Thursday, 20th August (Mr. S. F. Hacklin, Inman Valley).

Hills (altered to Gumeracha), Thursday, 27th August (Mr. R. G. Almond, Secretary).

Murray Lands (East), at Alawoona, Tuesday, 6th October (Mr. Angus Thomson, Alawoona).

Eyre's Peninsula (Central), at Minnipa, Friday, 23rd October (Mr. H. E. Broad).

Fruit (non-irrigated), at Greenock, Tuesday, 3rd November (Mr. A. Schubert, Greenock).

Each Conference will commence at 10.30 a.m. Members of Branches are invited to submit papers and questions for the agenda of the Conference in their respective districts.

Agricultural Shows.

We have been advised by Secretaries of Agricultural Show Societies that their shows will be held on the following dates:—

Northern Yorke Peninsula, Field Trial and Show—Bute, Wednesday, 26th August.
Naracoorte Sheep Show, Tuesday, 15th September.
Saddleworth, Saturday, 19th September.
Wudinna, Wednesday, 23rd September.
Waikerie, Saturday, 26th September.
Balaklava and Dalkey, Saturday, 26th September.
Eudunda, Wednesday, 30th September.
Laura, Wednesday, 30th September.
Kapunda and Light, Saturday, 3rd October.
Wirrulla, Saturday, 3rd October.
Burra Burra, Saturday, 3rd October.
Karoonda, Wednesday, 7th October.
Murray Bridge, Thursday, 8th October.
Cleve, Saturday, 10th October.
Moonta, Saturday, 10th October.
Blyth and Kybunga, Saturday, 10th October.
Loxton, Wednesday, 14th October.
Kimba, Wednesday, 14th October.
Colton, Wednesday, 14th October.
Yallunda Flat, Wednesday, 14th October.
Penola, Wednesday, 14th October.
Strathalbyn, Wednesday, 14th October.
Tailem Bend, Saturday, 17th October.
Mannum, Saturday, 17th October.
Paruna (Brown's Well), Saturday, 17th October.
Maitland, Wednesday, 21st October.
Pinnaroo, Wednesday, 21st October.
Mount Gambier, Wednesday and Thursday, 21st and 22nd October.
Willunga, Thursday, 22nd October.
Clare, Saturday, 24th October.
Port Elliot, Saturday, 24th October.

Kingston (South-East), Saturday, 24th October.
Minlaton (Central Yorke Peninsula), Wednesday, 28th October.
Tatiara (Bordertown), Wednesday and Thursday, 28th and 29th October.
Yankalilla, Saturday, 31st October.
Millicent, Saturday, 31st October.
Naracoorte Show, Wednesday, 4th November.
Kingscote, Kangaroo Island, Thursday, 5th November.
Mount Barker, Saturday, 7th November.
Woodside, Saturday, 14th November.
Kalangadoo, Saturday, 14th November.

Subsidy on Bulls.

At the Congress held in 1935, the Roberts and Verran (Eyre's Peninsula) Branch moved for an increase in the subsidy for the purchase of bulls. Reference was made to the high transportation costs, and a resolution was carried asking an increase in the subsidy by the Government paying the cost of transport. The Government has now approved of this by a regulation, under the Dairy Cattle Improvement Act, which gives the Minister of Agriculture authority to pay to the approved purchaser 50 per cent. of the boat charges, freight, and wharfage to Eyre's Peninsula, Yorke Peninsula, Kangaroo Island, or other island off the coast of South Australia.

Imperial Economic Committee—Grain Crops: World Production and Trade.

A report on "Grain Crops," covering the period 1928 to 1935, which has just been published by the Imperial Economic Committee, shows the improvement which has recently taken place in the statistical position of the wheat trade. The encouragement given to agriculture, especially to wheatgrowing, in various European countries, together with the increased restrictions on imports, greatly reduced the demand for overseas grain, and led to the accumulation of large stocks; this situation has altered materially in the past year and now, thanks to reduced acreage and drought, it appears probable that the world carry-over on 1st August next will be less than 17 million tons. In 1934 the carry-over exceeded 31 millions tons. Expectation of the gradual liquidation of these large supplies led, during 1935, to an advance in price to the highest level reached since 1930.

The report is mainly a statistical analysis of the world production of and trade in wheat, barley, oats, maize, and rice during the past eight years. It shows that the 1934 area and production of each of these five crops was lower than the average for 1928-1933, and that the Empire's share of the total stands at about 23 per cent., though for rice alone 56 per cent of the world's production is grown within the Empire. The most notable change during this period is the increased production of wheat, barley, and oats in the U.S.S.R., which has recently replaced the United States as the world's largest producer of these three commodities. Within the Empire Canada was formerly the largest producer of wheat and barley, but India now leads in these crops as well as in maize and rice.

International trade in these cereals and in wheat flour fell generally during this period with the United States the chief sufferer. Exports of these six products from the United States amounted to 5,646,000 tons in 1928, but, after a steady decline, to only 547,000 tons in 1935. Canadian exports, which at 11,759,000 tons were abnormally large in 1928, fell to 5,251,000 tons in 1935. From Australia exports have fallen since 1931, but have remained above the level of 1928-1930. The statistics of the importing countries show the other side of the picture: imports of these six commodities into France, Belgium, Netherlands, Germany, Switzerland, and Italy fell from 17,479,000 tons in 1928 to 8,861,000 tons in 1935. A section of the report is devoted to an exposition of the forms of import restriction imposed, and the duties levied by these six countries which have contributed substantially to the shrinkage of the European market.

A feature of the report is the calculation of the Empire's net position with regard to the trade in each of these products. The Empire has for sale to foreign countries a considerable surplus of wheat and flour which frequently amounts, in the case of wheat alone, to more than 2,000,000 tons. India normally has a surplus of rice sufficient to meet the import requirements of the other parts of the British Commonwealth, but for the secondary cereals it is necessary for the Empire to have recourse to foreign sources of supply.

THE HUMUS VALUE OF VARIOUS PLANTS FOR COVER CROPS.

Replying to a question as to the value of various plants for cover crops which was submitted by a delegate from the Block E Branch at the River Murray Agricultural Bureau Conference at Renmark, Mr. W. J. Spafford (Director of Agriculture) said the humus value of green-manuring plants will be decided by the quantity of easily-decomposed organic matter that is produced in a given time. When green manuring in the orchards of South Australia, and particularly in the fruitgrowing areas of the River Murray, the sole object is to increase the organic matter content of the soils. Humus is fully decomposed organic matter, and so long as fruitgrowers produce profuse growth of any plants which are easily decomposed, they are doing all that can be desired in this direction.

Plants grown for green manuring return to the soil only what they take from it, except for the carbon and oxygen taken from the air, and in the case of legumes, some nitrogen as well. The mineral matter, of course, is brought from some depth, and is deposited near the surface of the soil when the plants are ploughed in.

The importance of using nitrogen-collecting plants for green manuring has been overstressed, for although the nitrogen is valuable, unless used by plants soon after it is liberated, it is leached out of the soil, particularly in irrigated areas. On the other hand, several of the forms of bacteria responsible for the decomposition of the green manure collect large quantities of nitrogen from the air whilst doing this work.

On the River Murray fruit areas the deciding factors as to what are the most suitable green-manuring plants for growing between the rows of vines or trees will always be connected with what can be grown between the times when water is available, and what can be put into the soil without injuring the roots of the trees or vines.

It seems that one of two methods of growing green-manuring crops may be followed:—(1) By taking a special watering in March and growing rye (or other cereal) or mustard, and ploughing the crop under not later than July; (2) by ploughing thoroughly in winter, and on the irrigation given at the end of July seeding the land with mustard or rape, and instead of ploughing the crop under, chop up the growth with a disc cultivator, leaving the organic matter on the surface, as farmyard manure is left, until ploughed under the next winter.

THE CUMMINS BUTTER FACTORY.

On 19th June what might be considered a very big step in the development of Eyre's Peninsula took place at Cummins in the official opening of the Cummins Butter Factory.

The Hon. A. P. Blesing, M.L.C. (Minister of Agriculture), was very interested in this indication of development, and being unable to attend personally asked Mr. A. W. Christian, M.P., to represent him and to state that in his opinion the opening of this factory, besides helping to cater for the dairy produce of Eyre's Peninsula as a whole, must be a decided boon to landowners of the surrounding district. He pointed out that, during the last few years, the production of dairy produce in the shape of butter had increased from about 5 tons per week to approximately 20 tons of butter per week. The encouragement of sidelines had been the policy of the Department of Agriculture for some years, and it was very pleasing to see that there was enough faith in the country to spend local capital in the erection of an up-to-date butter factory.

Mr. Clarke, the proprietor of the Cummins Butter Factory, has spared no expense in providing an up-to-date buttermaking plant, and the fact that the farmers' cream can now be treated a very short time after leaving the farm should go a long way to improving the quality of the butter and help the farmers to receive remunerative prices for their products.

In his opening remarks Mr. Christian explained the Butter Equalisation Scheme and Dairy Produce Act. He pointed out that this Act was purely a marketing Act to enable farmers to receive comparatively profitable returns, and to obtain some advantage from the Australian price. The legislation was working very satisfactorily, and had at least given to dairymen an additional 2d. per lb. for their produce.

Mr. Christian was assisted at the function by Mr. H. B. Barlow (Chief Dairy Instructor) who represented the Department of Agriculture in the unavoidable absence of the Director (Mr. W. J. Spafford). Mr. Barlow said that the factory at Cummins was under departmental supervision, and farmers could be assured that their produce would receive the same supervision as if it were treated on the mainland. He considered that the factory was quite comparable with the majority of mainland factories, and if given the support it deserved should be a wonderful acquisition to the district.

At the invitation of Mr. Clarke about 250 local farmers and their wives attended the opening ceremony, and after inspecting the factory and plant were entertained by Mrs. Clarke at afternoon tea.

Museum of Agricultural Implements.

The Minister of Agriculture (Hon. A. P. Blesing) is now in the position to state that the Committee recently appointed by him for the purpose, and consisting of the Director of Agriculture (Mr. W. J. Spafford), Messrs. H. T. Gray, G. H. A. Mahood, L. S. Smith, and Colonel C. P. Butler (''Yattalunga'') is functioning, and has made a start with the collection of ''old'' implements for exhibition in a building to be provided at the Show Grounds. The Government is pleased to provide freight for any article of agricultural equipment which the committee considers suitable for the proposed museum, and as some odd repair work will be necessary for some of the articles, the sooner donors supply them to the committee the more chance there will be of having them ready for the forthcoming Centenary Show. The type of the placard to be placed on each article donated has not yet been decided upon, but in any case, it will contain the name and address of the donor, and the details supplied as to the history of the exhibit.

The Secretary to the Minister of Agriculture, or any member of the committee, will be pleased to hear of any old agricultural implement or article of agricultural equipment which a person is prepared to donate for this very laudable attempt to get together a historical collection of things that have had something to do with our agricultural progress. Nothing will be too small or too large if it fulfils the requirements of the scheme, and the Committee will give consideration to every offer as soon as possible after it has been made.

Meat Inspection.

The Library of the Department of Agriculture acknowledges the receipt of a ''Textbook of Meat Inspection,'' by J. Drabble, B.V.Sc., published by Messrs. Angus and Robertson, of Sydney. This work is eminently suited for the requirements of those studying for meat inspection examinations. It is a handy reference book for the Meat Inspector, and contains concise information on all phases of this work. The price of the book is 21s.

Trees and Diminishing Rainfall Averages.

The following question, asked by a delegate from the Eurelia Branch at the Upper North Bureau Conference on 15th July, was referred to Mr. G. J. Rodger (Conservator of Forests), of the Woods and Forests Department, who says:—

The extent to which the reduced rainfall, which it is stated has been experienced for a number of years, can be attributed to the destruction of timber in the farming districts and the wholesale dying of the bushes and timber in the pastoral country, cannot be definitely stated.

Apart from the time required, the great obstacle to arriving at a safe conclusion as to the effect of vegetation on precipitation lies in the difficulty of choosing rain gauge stations where all the factors are identical, except vegetative cover. There is often, for instance, an unevenness in precipitation at nearby stations where the physical surroundings appear to be similar.

It is known that the air of forests is cooler and moister than air in the open, and it would seem, therefore, that forests should have some influence on precipitation. On the other hand, precipitation depends chiefly on wind currents and other powerful agencies, compared with which the influence of the forest must be very small.

Although the comparison of numerous observations of precipitation at stations within and outside the forest in various parts of the world show conflicting and extremely varying results, the balance of the evidence appears to favour the contention that forests increase precipitation, though to what extent is very uncertain.

As far as the very local effect is concerned, the larger percentage of observations indicate that there is a large precipitation over the forest, the excess varying from 1 to nearly 50 per cent. Over the period of 10 years, observations in North Germany indicate that the increase in precipitation over forest country is very small at sea level, but increases rapidly with elevation, rising to nearly 50 per cent. at about 2,500ft.

A comparison was made over a period of 7 years of the rainfall data in a small pasture surrounded by large forests near Nancy, France, with the precipitation at a station at the same elevation in a nearby region practically without forests. The precipitation at the station surrounded by forests was considerably more than at the stations in the open, but varied with the season, as shown in the following table:—

Spring	7 per cent.
Summer	13 per cent.
Autumn	23 per cent.
Winter	21 per cent.

Observations on the steppes of southern Russia, where 5,000 acres of forest were established in entirely open country; are of considerable interest. The forest was established between 1845 and 1863. Two stations, one over the forest and one outside, were established in 1892. During the period 1893-97 the precipitation over the forest was 23.9 per cent. more than in the open. Bavarian observations and others made elsewhere within recent years show much less influence of forest vegetation on local precipitations than indicated by the above data.

Compared with the local effect, it is often contended that the effect of forest vegetation on precipitation is much greater over vast areas, often miles in extent. The forest cover profoundly influences the evaporation of water from the land. Although evaporation from the soil is much less in the forest, the loss of moisture from evaporation, combined with the loss from transpiration through the foliage, may be, and usually is, much greater than the loss from denuded areas.

The more abundantly developed the vegetative cover, the faster the moisture is returned to the area through the evaporation and transpiration combined, and the larger amount available for re-precipitation farther inland. Thus Breckner, of Germany, has pointed out that it is often evaporation from the land that supplies the atmosphere with moisture for precipitation, even more than evaporation from the sea.

Zon, R., of U.S.A., in a paper entitled, "The Relation of Forests in the Atlantic Plain to the Humidity of the Central States and Prairie Region," contends that forests, by increasing the evaporation and transpiration at the expense of the surface run-off, enrich the passing air currents, and in this way help to carry additional moisture into the interior of continents. He concludes that 78 per cent. of all the precipitation for the land area is supplied by the area itself, and that the amount supplied is largely dependent upon the forests. Thus, he points out that in the south-eastern United States as soon as the moisture-laden winds from the Gulf of Mexico reach the land they are cooled and begin to lose part of their moisture, but as they move to the north-west they become dryer, and precipitation decreases. If precipitation over the land depended entirely on the amount of water brought by the prevailing winds from the Gulf, abundant precipitation would be confined to a narrow belt close to the sea. Zon contends that in the south-east of U.S.A., if the winds in their passage to the north, north-west, and north-east did not encounter the forests bordering the coast, and were not enriched after precipitation by the large amount of moisture from them, the rainfall farther inland, even in the prairie States, would be far less than it is.

In the same manner it is argued that the forests of Sweden have an important influence on the precipitation in the countries to the east into which the prevailing winds blow.

In conclusion it might be said that although meteorological data cannot be assembled to prove definitely that forest growth appreciably increases the total amount of precipitation, theoretical conclusions certainly point to a distinct influence of the forest on precipitation over vast regions of non-mountainous country.

Apple and Pear Industry—Extension of Research and Instructional Facilities.

Consequent upon the recent provision of a Commonwealth grant for the purpose of furthering research into problems of apple and pear growers, and for extending instructional facilities in the several States, three new officers have been appointed to the Horticultural Branch of the Department of Agriculture.

Mr. H. K. Kemp, B.Ag.Sc., has been appointed Horticultural Research Officer, and will undertake in co-operation with present staff investigational work on Codling Moth, the removal of spray residue, Black Spot, fertilisers, &c. Experimental and demonstrational spraying plots will be laid down in representative districts, and it is hoped that growers will take a keen interest in the progress of the proposed field work.

Messrs. E. B. Chamberlain and G. Harris have been appointed special Instructors, and will devote their whole time to advisory work in connection with the reworking of unsuitable varieties of apples and pears, and to instruction in packing of these fruits for export and Interstate markets.

Mr. Chamberlain will carry out this work in all districts north of the main road through Norton's Summit to Mount Torrens, and Mr. Harris will take charge of districts south of this road.

Later in the season, reworking demonstrations will be given in different districts, and in the meantime the officers are available to discuss reworking with individual orchardists, and to render any advice or assistance which may be desired.

During the apple packing season these same officers will act as apple and pear-packing instructors.

All apple and pear growers who are interested in either reworking of out of-date apple and pear varieties or in any phase of preparation of these fruits for export, are invited to make contact with the Horticultural Branch office, Exhibition Buildings, North Terrace, Adelaide, or with the special Instructor in their area. Letters may be addressed to Mr. E. B. Chamberlain at Paracombe (Telephone, Houghton 28), and to Mr. G. Harris, Balhannah.

In due course demonstrations in methods of reworking and in packing will be arranged, and any Agricultural Bureau or group of growers desirous of having such demonstrations in their district are asked to communicate with the Chief Horticultural Instructor.

Production of Butter and Cheese.

Production of butter and cheese for May, 1936, was as follows:—Butter, 759,613lbs.; cheese, 415,851lbs.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers of the Stock and Brands Department.]

Dog with Distemper.

"Millicent" reports puppy 4 months old, froth at mouth, jaw and neck swollen, and partially paralysed. Body is twitching and dog has difficulty in drinking.

Reply—The trouble with the dog is undoubtedly distemper in a very bad form. Give milk foods only and keep him very warm and quiet. It is impossible to cure the spasmodic twitching, but the following mixture may help:—Potassium bromide, 10 grains; aceto-salicylic acid, 10 grains; bismuth carb., 10 grains; dimol, 5 grains; water, 2 drachms. Get 4ozs. of this solution and give 2 teaspoonfuls twice a day.

Greasy Heels.

"Wasleys" asks for a cure for greasy heels in horses.

Reply—It is difficult to obtain a complete cure. The following treatment is advised:—(1) Wash affected area thoroughly with soap and water containing a little washing soda. (2) Apply the following dressing for a few days:—Copper sulphate, 5 teaspoonfuls; zinc sulphate, 5 teaspoonfuls; water, 1 pint. (3) Give internally one tablespoonful of Fowler's solution of arsenic night and morning for 14 days. To give, mix in a small damped feed.

Horses with Severe Cold.

"Wasleys" reports horses affected with a bad cold.

Reply—Have the following electuary made up:—Powdered camphor, ½oz.; powdered myrrh, ½oz.; liquid extract of belladonna, 2 drachms; potassium chlorate, 1oz.; honey, 4ozs.; glycerine, 4ozs. *Directions*: Place a tablespoonful on the back of the tongue three times daily. Keep the animals warm—do not work or allow to become overheated—give green foods if possible and a bran mash twice a week with 3ozs. of Epsom salts in each.

REARING ORPHAN LAMBS.

Seeking advice as to how to rear orphan lambs, the Secretary of the Wolseley Branch of the Agricultural Bureau has been advised by Mr. A. H. Robin, B.V.Sc., of the Stock and Brands Department that orphan lambs may be successfully reared on cow's milk, though close attention is necessary for the first month. For the first week, the lamb should get some ewe's milk if possible by letting it suckle from a ewe whose lamb is not yet old enough to take all of her milk. The cow's milk used should be from a cow giving milk rich in fat, if necessary additional cream may be added. Always use milk from the same cow. During the first few days and nights, feed the lamb only small amounts at a time (not more than 2 or 3 tablespoonfuls), but it must be fed often—every 2 or 3 hours. Feed the milk from a bottle with a medium sized nipple attached and always feed at blood heat (about 100° F.). Carefully wash bottle and nipple after each feeding. After the lamb is 2 to 3 weeks old, three feeds a day should be ample.

THE MILK SUPPLY OF LONDON.

REPORT BY MR. W. A. HAMILTON, M.P.

To His Excellency Sir Winston Joseph Dugan, Major-General, Knight Commander of the Distinguished Order of Saint Michael and Saint George, Governor in and over the State of South Australia and its Dependencies in the Commonwealth of Australia.

May it please your Excellency:

In pursuance of the Commission issued to me by your predecessor, Sir George John Robert Murray, authorising me to report upon the Milk Supply of London, I have the honour to present my first and final report.

I commenced my inquiry into the Milk Supply of London by visiting the head office of the Milk Marketing Board at Thames House, London, where I was courteously received by the Secretary, and given whatever information I asked for.

CONTROL.

The Milk Marketing Board was created under the authority of the Agricultural Marketing Act, 1931, and the Milk Marketing Scheme applies to the whole of England and Wales. As by far the larger part of the milk used in London is necessarily produced outside of the metropolis, it was expedient to make some inquiries further afield, and I obtained information of a general as well as a specific character, all of which has a direct bearing on the milk supply of London.

The present scheme was established with the object of helping the dairymen of England, who, as a result of ruinous competition and the general trade depression, found it almost impossible to get a living. Indeed, many thousands could not get a living by producing milk, and eked out an existence by producing other foodstuffs, much of which they consumed themselves, or sold at very low prices at the nearest market town. At the consuming end of the industry the fierce competition for customers made it impossible for distributors to make a reasonable profit. As soon as one price-cutter was forced out by the law of supply and demand, another took his place, and there was no order or regularity in the industry. It is not an exaggeration to say that it was in a state of chaos.

Under the scheme, England and Wales are divided into eleven regional districts, and there is a local Board for each district to carry out the necessary details. The Central Board consists of 16 members elected by the milk producers, two nominated by the Minister, twelve regional members, and two co-opted by the elected members of the Board. The Board has power to elect a Chairman and Executive Committee, and such other committees as may be necessary, and it is paid for its services. The whole of the milk used by the population of London and the great centres throughout the country is more or less controlled by the Board and the regional committees.

PRODUCTION.

The Milk Marketing Scheme was commenced on the 9th October, 1932, and has been in operation from then to the present time. It is a compulsory scheme, under which 160,000 farmers, hereinafter called the first class, are registered and controlled as regards the production and sale of their milk, and about 70,000 producer-retailers, called the second class, who are also registered. A farmer having not more than four milch cows is exempt from registration. The retail price for the producer-retailers is fixed at the same rate as other distributors have to charge. The Board also buys surplus milk from them.

The first class of producers must sell their milk to the Board, and it is all received as "liquid milk," which is the milk ordinarily supplied to distributors for immediate use as food. The surplus not required by distributors is sold to manufacturers of various milk products, such as dried milk, butter, cheese, and many other things into which milk is manufactured. (It is interesting to learn that the horn rims used on spectacles, usually supposed to be tortoiseshell, are made of compressed milk). The price for liquid milk varies at different times, but is usually somewhere in the region of 15d. per gallon. The average price for milk required for manufacturing was about 3½d. per gallon. As only the surplus is sold at this latter figure, it has not affected the farmer so much as yet, but the more surplus milk there is the lower the general price must be, because the prices are averaged out, and while the manufacturer obtains the milk for 3½d., or thereabouts, the farmer, notwithstanding that liquid milk was sold for 1s. 3d., may only get something in the region of 11d. net. The above prices were supplied to me at the commencement of my inquiry early last May, but when the Board's balance-sheet was presented on 6th June it was shown that they were much better. Further reference to this is made in the section under "Distribution."

As the Board is the central authority for the purchase and sale of all milk produced under the scheme, with the exception of that retailed by the producer-retailers, its turnover is necessarily very large. Last financial year its income and corresponding expenditure was a little under £36,000,000. A levy of one farthing per gallon has recently been made to provide for the expenses of the Board. This has not all been spent, there being an amount in reserve of £295,349. The expenses of administration for the year under review amounted, approximately, to one-twelfth of a penny per gallon of milk sold. Each producer is compelled to sign a comprehensive agreement, binding himself to the conditions laid down by the Board in regard to the quantity of milk that he can produce each day, the number of cows that he keeps, the level delivery of milk (which means that the Board requires so many gallons from him per day), where he shall deliver it (whether at a railway station or whether the Board shall collect it at his farm), and numerous other provisions, all of which tie him absolutely to the Board for the purchase of and consequent payment for the milk that he produces. The regional price is fixed after calculating quality, quantities, railway and picking-up charges, and various other things, and when this is done, cheques for the produce are sent out to each individual producer.

An important feature of the scheme is that outlying districts, such as Devonshire or distant parts of Wales, receive the same price as a producer near, say, London, or any other great centre of population. This was done partly to give all producers a nearly equal opportunity of making a living, and partly to prevent supplies of very cheap milk being rushed in at convenient periods to the great centres, the effect of which was to cut down the local price obtained by the producers. It is not difficult to conceive that producers near London were much better off than those in more remote parts of the country because of this difference in distance from the best market. The scheme now nearly equalises the returns to the producer in every region. Therefore one effect of the scheme has been that producers near great centres of population are often worse off than they were before, but the majority, taking the country as a whole, are better off.

DISTRIBUTION.

The operations of the Board under this heading are of large dimensions. The total quantity of milk bought and sold last year was nearly 913 million gallons; 71 per cent. of this quantity was used as "liquid milk" for domestic purposes and 29 per cent. for manufacturing. The average realisation value of milk for manufacturing was 4.92d. per gallon. This price was raised by assistance, provided by the Government, to 5.92d. per gallon. The above figures are taken from the Chairman's

Statement to the meeting held on 6th June. The effect of the Government grant has been to raise the pool prices to the producers by ⅜d. per gallon. When this was averaged out on the price of liquid milk it brought the whole production to 12.125d. per gallon.

As the result of negotiation by the Board with the distributing Companies and private firms and manufactures, a better price was obtained last year, and this seems to indicate that the producers, being controlled from one centre, are able to make a better bargain collectively than they could by selling individually. The average prices before the scheme started were much lower than they are now. It seems therefore that collective bargaining has been an advantage to the producers.

The three largest distributing agencies in London are United Dairies Co., with a capital of £1,000,000; Express Dairies Co., whose operations are not quite so large; and the Co-operative Wholesale Society. I visited each of these great companies and was given courteous answers to my inquiries. United Dairies serve about a million customers, but I did not obtain the exact numbers from the Express Co. or from the Wholesale Co. One reason why the Wholesale Co. could not give them is, because most of their distribution is made in bulk to their constituent Co-operative Societies and their customers call for the milk themselves. Refrigerating, bottling, and pasteurising plants are used by all of them, the latest being a very elaborate and costly plant owned by the United Dairies Co. I was shown over the whole of this establishment which was new and modelled on the most approved scientific principles. Both the United Daïries and the Express Co. advertise extensively (and expensively). The latter Company has a monthly Journal which is a most interesting publication. Both Companies spend very large sums in Research work and laboratory tests of every description. In a pamphlet issued by United Dairies in July, 1933, Professor Jameson, M.A., M.D., F.R.C.P., wrote a foreword in which he saïd "The fact that London has as safe a milk supply as any in the world is due in large measure to the efforts of certain big distributing companies—efforts which, incidentally, have not been without profit to the companies themselves. Directors are just as much concerned in doing what they can to improve the production of milk throughout the country as they are in distributing it in the best and safest manner to the public." Further on he remarked that "Progress is impossible without co-operation, and, as a member of the Public Health service, I am glad to have the opportunity of associating myself in this small way with what I believe to be a really helpful contribution to the solution of the problem."

The agitation for a pure milk supply in England has been going on for many years. Progressive steps have been taken at different times to improve the conditions of the industry, but it is no easy matter to get an army of 230,000 milk producers to work on the rigid methods suggested by the distributors and enforced by the Board. There are four essentials for pure milk insisted on by the distributing Companies of London, and in this way they are well supported by the Board.

1. Operators, when milking, must have clean dry hands.
2. Utensils must be well scoured and sterilised.
3. Safety: which means freedom from the presence of dangerous bacteria.
4. Reduction of diseases in dairy cattle.

It has been proved beyond any doubt that the principal contamination of milk occurs in the first stage of production. Some of the farmers neglect to wash and dry their hands before commencing to milk, and then place the fluid in containers that have not been properly scoured and sterilised. Bacteriological examinations in a multitude of cases and through a long period of years have disclosed the fact that it is in these early stages where the greatest damage is done. It has also proved that a milk which is unsatisfactory in the first stage, cannot be made satisfactory by pasteurisation.

Determined efforts have been and still are being made by distributors and the Board to educate the farmers. These efforts have not always been successful, but substantial improvements have been effected, and are still going on. It is difficult to convince a farmer that certain methods which he has been accustomed to for many years have got to be altered in the interests of the general health. He grows very indignant at being interfered with or advised, and too often insists on going his own way no matter how wrong it may be. To overcome this, the distributing Companies have induced model farmers to do the milking and use their own utensils at different places where it was known that milk was being produced under bad conditions. Tests of the milk produced in the old careless way have been compared with that produced under proper conditions, and the results are astonishing.

In the pamphlet previously mentioned, which was prepared by Mr. Ben Davies, Director of Laboratories, Processing and Inspection for United Dairies, the details of a most interesting experiment are fully described as follows:—

> ''Abundant experience, supported now by thousands of both pre-pasteurisation and post-pasteurisation bacteria plate counts, prove that with no more than a measure of regard for the merely domestic decencies, together with a simple and economical procedure for sterilising all utensils, it is possible to produce milk of consistently good bacteriological quality.
>
> In order to demonstrate finally that it is within the ability of the small producers to attain a satisfactory standard of bacterial quality, an experiment was initiated in connection with the supplies of one of the country creameries of United Dairies, where a system of premiums for the attainment of specified bacteriological standards has been in existence for some years. A number of the smaller producers were interested in the proposed experiment, none of whom had more than barely qualified for the bonus offered for the bacterial standard.
>
> The simple conditions laid down provided that the cows' udders should be clean, that milking should be effected with clean dry hands, that the first jet of fore milk should be discarded, and that all utensils should be sterilised. The steriliser provided for the equipment was merely a wooden box fitted over the farm copper, into which the various utensils, including the milk refrigerator, were placed for steaming after proper washing—a thermometer being provided to ensure that the boiling temperature was actually reached.
>
> The average bacterial count of the twelve farmers previous to the experiment in the month of February (1933) was 427,000 per cubic centimetre, with coliform organisms generally present in 1-1000 cubic centimetre. At the end of the experiment the average plate count of the milk as delivered at depot was less than 6,800 per cubic centimetre. In no less than nine of the twelve samples *b. coli* were absent even in one cubic centimetre and the average figures were superior to those obtained in the case of the Company's ''Grade A. Tuberculin Tested'' supplies for the same month. In the light of the facts contained in the foregoing pages, perhaps the most significant results lie in the post-pasteurisation figures. Previous to the experiment, the average bacteria count of the twelve farmers' supplies, after laboratory pasteurisation, was 27,000 per c.c. At the end of the period the supplies of no less than six individuals showed clean plates after pasteurisation. The average ''count'' of the whole twelve was merely 23 organisms per c.c. while the highest count in any one instance was 100 per c.c.
>
> An interesting corollary of the experiment arose when six of the twelve farmers, after their experience in clean milk production on their own farms, were asked to visit six other producers and undertake the milking on one afternoon, and thus to demonstrate what improvement could be effected with no special preparation whatever, other than the transfer of their own sterilised utensils, which they took with them. In the following table, the first column gives the normal bacteria count of each supply taken four days previous to the visitors' attendance—the result of whose work appears in the second column.

TABLE E.

Farm.	Owner.	Visitor.
	6/3/33.	10/3/33.
1	3,000,000	2,500
2	3,000,000	1,900
3	25,400	5,500
4	70,000	2,900
5	24,500	900
6	3,000,000	500

The plate count after pasteurisation in each case was :—

Farm.	Owner.	Visitor.
	6/3/33.	10/3/33.
1	80,000	100
2	100,000	200
3	600	100
4	3,900	100
5	1,000	300
6	200,000	100

At No. 2 Farm, the cows were milked by machinery. In this case half the herd was milked by the owner on his own machine, and half by the visitor's sterilised unit which was connected for the purpose. The results were as follows :—

	Owner.	Visitor.
Before pasteurisation	3,000,000	1,900
After pasteurisation	31,000	200

The methods of production which have to be followed in order to obtain such a standard universally do not depend on a preliminary course of instruction in elementary bacteriology to milk producers and their milkers. It is enough to lay down a few positive and dogmatic rules which cannot be departed from, and which the plain, hard-working folk who are responsible for a great proportion of the milk production of the country can easily practise and understand. These methods are dictated not only by science, but by regard for the common decencies which are properly expected to apply to the production and preparation of every article of human food. They comprise little of art and nothing of mystery.

If these rules are observed, the production of clean milk of good bacterial quality becomes automatic and even unavoidable. On the other hand, if they are neglected or relaxed, the laboratory tests which are proposed will very soon expose the fact and relegate the milk to that lower class to which it belongs, and which should receive payment at substantially lower rate. The production of dirty milk should be made too costly a luxury. Unclean milk should be definitely excluded from utilisation as human food.''

One very bad feature which arises from careless milking is that one negligent farmer, using unscoured and unsterilised utensils to pour his milk into, contaminates and spoils large quantities of pure milk. Elaborate tests have been made by emptying a few cans (churns) of carelessly drawn milk into one of the 3,000 gallon containers, and have proved that in a very few hours dangerous bacteria has developed in countless millions.

In the light of the above, perhaps it is not to be wondered at that thinking people in England should insist that this essential commodity should be produced in a clean, wholesome fashion. There is probably no known food subsance that is more susceptible to infection by dangerous germs than milk, and it is of the utmost importance that it should be kept free from contamination from the cow to the consumer. Notwithstanding these convincing tests, however, a rather large percentage of farmers become negligent at times—others are so by habit—and while the general results are noticeably improved there still remains much educational work to be done. When the milk reaches the great central depots numerous samples are taken and tested in four different ways before it goes into consumption. (One firm alone employs 102 qualified chemists for this purpose.) It is then cooled, and pasteurised by heating to a temperature of 145/6F. and is then passed over refrigerators ready for sale to the public. .

The conveyors from country to city have recently been very greatly improved. Enormous vessels, mostly holding up to 3,000 gallons for railway, and 1,200 gallons for motor transport, convey the milk to the chief distributing centres in London. These vessels, the inside of which is coated with glass, are so constructed that, even on the hottest day, the temperature of the milk does not rise more than one degree. Sometimes milk trucks are attached to express trains and the railway companies seem to do everything possible to facilitate the rapid transport of milk to the cities.

An important feature of the transport system is that from the time the milk is put into the glass-lined containers until it reaches the consumers who buy it in bottles, it does not come in contact with the amosphere or any deleterious matter. Those who buy milk from open containers are therefore not so safely supplied as those who buy the bottled article.

The practice of delivering milk in bottles appears to be increasing. No doubt this adds to the cost of distribution, but it is now known by most people that once the milk is exposed to the atmosphere, dangers of contamination are greatly increased. One firm supplied me with the following figures:—33 per cent. of their bottled milk trade is delivered in quarts, 55 per cent. in pints, 18 per cent. in half-pints, and 3 per cent. in one-third pints for schools. This firm's weekly output is 500,000 gallons of milk.

COST OF DISTRIBUTION.

Many complaints are made that the cost of distribution is far too high. The same complaint as regards milk is made all over the civilised world. The minimum retail prices fixed by the Board and now operating are 2s. 4d. per gallon, with a reduction of 4d. per gallon for quantities of more than one gallon, not exceeding four gallons delivered to one buyer at one place within twelve hours, and 6d. per gallon reduction for more than four gallons but not exceeding ten gallons. For delivery to local authorities, public bodies, voluntary hospitals, 1s. 6½d. per gallon. Sales beyond ten gallons are considered wholesale, and the profit on these would be about five per cent. The difference in the price received by the producer to that paid by the householder is nearly 1s. 4d. per gallon, but this is on the small deliveries only.

The Milk Board is making efforts to reduce the cost of distribution. It is true that the distributing companies are now making profits which they could not make before the Board took control of the industry, but they say that they cannot reduce their charges unless they eliminate two things. The first is the very costly and elaborate systems for guaranteeing pure milk before it is delivered to the consumer. The second is duplication in delivery. No one desires the abolition of the scientific safeguards that are now so extensively in use. Obviously that is unthinkable, and consequently attention is being paid to the second proposition.

During the Great War, in 1915 to be correct, the shortage of men became a potent factor in causing a number of reputable dairy firms in the Metropolis to amalgamate, thereby creating United Dairies Ltd., and it is claimed that this was the first step towards the rationalisation of London's milk service. Notwithstanding this operation, which meant the elimination of at least eleven distributors, there are still not less than a dozen, and probably more than twenty large distributing firms and a host of small ones. Assuming that there are no more than twelve it means that in any street of, say, 50 houses, there is a strong probability of every firm having customers in it. And not only that—which should be considered bad enough—but owing to the fact that so many people are now living in flats, it is a common thing to see a dozen milk carts calling at one house. This causes a tremendous amount of overlapping and creates expense in the way of overhead costs, superintendence, wages, horse or motor costs, wear and tear of vehicles, &c., &c. Then again, as customers are scattered, quite long distances have frequently to be traversed by a vehicle to supply a single customer. This also greatly adds to the cost of distribution. It is obvious that if the street of 50 houses were supplied by one or two vehicles and the same applied to the whole of London, the cost of distribution would be enormously decreased. This may be done by further amalgamation of firms, but it is unlikely that the Board itself will attempt to take over the retail distribution of milk, nor is it considered wise to attempt it. There is something to be said that if the whole of the distribution were carried out by one or even two firms, the lack of competition would bring many evils in its train. Still it is hoped that time and better organisation will gradually remove the waste that is constantly going on in the industry. Does it require another great war to lead or force traders and the general public to a realisation of this waste of time, money and effort?

CONSUMPTION.

The price has increased to the consumer by about 1d. per quart, but at the time of my inquiry there had been no change for nine months. It is to be noted in this connection that the Consumers' Committee reported to the Minister of Agriculture that retail prices had been "substantially increased" since the introduction of the scheme. If the increase is no more than 1d. per quart it should not be felt much by the consumer. The difference will be in the large quantities of milk delivered to hotels or restaurants, and places of that kind. It is obvious that 1d. per quart could not very well be added on to one-half and one-third pints of milk and as no retailer can charge more for his milk than the Board allows, it is difficult to see where the small consumer has any substantial ground for complaint. The costly and elaborate refinements of treatment described under "Distribution" have to be paid for by somebody. There is no escape from that. The new methods are expensive, but they are always clean. The old ones were cheap and usually dirty.

Taking the price which the farmers obtained last year, at 12.125d. (although the distributors pay more than that) the gross profit to them on small deliveries up to one gallon, works out at nearly 132 per cent. The gross profit on the larger deliveries is much less, but the net profit is probably more. It is this 132 per cent. gross profit about which so many complaints are made by the householder. He is apt to make comparisons between what he knows is the general profit made by retailers in other trades, which ranges from as low as 10 per cent. to as high as 33⅓ per cent., and he thinks and says very emphatically that distributors of milk are making exorbitant profits at 132 per cent. He forgets, or ignores, the outstanding fact that it nearly always takes less time and labour and general expense to deliver two or three gallons of milk at one place than it does to deliver the same number of pints at separate places. And again, the average householder does not realise the amount of close, hard-thought-out organisation and attention to detail that is required so that he shall receive his pint or two pints of milk in good time every morning.

The present price of 3½d. per pint for good clean milk cannot be considered excessive in comparison with other beverages, none of which have anything like the food value of milk, and in none is there the same expense in delivery. The householder is quite willing to take advantage of improved methods but grumbles at having to pay for them. This habit of mind is not peculiar to milk consumers.

As previously stated, great efforts are constantly made to educate the farmer and thereby induce him to produce an article of food that is clean and wholesome. Not only that, but he is often more or less heavily fined for breaches of the very stringent rules and regulations imposed by the Board and the Health Act, to say nothing of being engaged in an exacting occupation which often keeps him busy from 3 or 4 o'clock on Monday morning until 9 o'clock on the following Sunday night. He never gets too much time for sleep, and practically none for recreation. That may not apply so much to the larger dairymen who employ labour, but it is quite true as regards many thousands of small producers. So that, while the farmer is being drilled and educated and fined, it is not out of place to suggest that some education might well be administered to the consumers in the direction of having a little more kindly consideration for the other fellow.

GENERAL.

The Milk Marketing Scheme has certainly brought the industry into a better condition than it was before. Producers are getting better returns; distributors are making reasonable profits which they could not make before, and the public are getting cleaner and therefore more wholesome milk. But while this side of the picture is all to the good it is to some extent dependent on the Government grant which in the year which closed last May or thereabouts, amounted to £1,343,199. Even this large sum of money only increased the farmers' returns by ⅜d. per gallon, but it is difficult to see how much improvement in the industry could have been effected without it.

Three things, however, seem fairly certain. The first is that the farmers insist that they cannot produce milk at a lower price than they obtain now. The second is that the distributors declare that they cannot make their businesses pay if profits are reduced. The third is that if the Government grant is withdrawn, as indeed the Board is afraid it will be, the public will have to pay more for their milk. These are some of the many difficulties which beset the Board.

Granting that the general condition of the industry has improved, repercussions have occurred which are giving statesmen and the Milk Board grave anxiety. The most important of these is that while there was some over-production of milk before the present scheme was initiated, it has increased very largely since. The Chairman of the Board, speaking at the annual meeting held on 6th June last year on this aspect of the scheme, said, "The details of milk sales shown by our records disclose a definite tendency for production to increase. The average daily quantity of milk sold wholesale in this period has increased by nearly 18 per cent. over the corresponding amount last year. This increase was not fully anticipated, but, nevertheless, all supplies have been marketed."

As the Board is under contract to purchase all the milk produced by Class 1 of the producers in England and Wales, in addition to large quantities from Class 2, this increase is embarrassing it to a serious degree, and up to the time I left England no workable scheme had been discovered that would overcome the difficulty.

The causes of the rapid increase are not hard to discover. While no great profit can be made by the dairymen, even at the increased prices that the Board pays them for milk compared with those obtained under the haphazard methods of selling prior to the establishment of the Scheme, it was, and still is, better than anything else, and while the prices of other produce are low and can only be obtained by hard bargaining and sometimes losses by poor crops and bad debts, milk is a fixed price and the money is sure. Consequently, as many dairymen as could afford it have added another cow or two to their herds. Female calves that would have gone to the butcher became milkers, and the producers neglected other kinds of produce for the more certain one of milk production. This process is going on at an ever-increasing ratio, and seems likely to continue.

It may not be out of place at this stage to remark that a similar situation arose in France when some years ago that country prohibited the importation of wheat and fixed a payable price for the locally-grown product. In a very few years

France was overloaded with her own wheat, because her producers ceased planting crops for an uncertain market and devoted most, if not all, their attention to the crop that had a market assured to them.

Unless the British Milk Board can devise some means of overcoming this serious difficulty in addition to those they have put in operation up to the present time, it is certain, or at least highly probable, that a similar problem will arise in England as regards milk. It is difficult enough now and seems likely to get worse. Arising out of the desire of the farmers to produce milk in preference to other things, another problem has presented itself which does not affect the Board, but is a serious one for the landowners. A large percentage of the dairymen are tenant farmers, and since the Scheme came into operation they are constantly urging the landowners to erect more cow byres and other conveniences to accommodate a larger number of cattle. Under the very exacting local, as well as National Health Regulations, these structures are expensive, and as landowners, owing to excessive taxation and the general depression in agriculture, are often little if any better off than their tenants these demands are embarrassing them to a serious degree. They are afraid that the Scheme will break down of its own weight and they will be left with a lot of costly buildings on their hands that tenants will have no use for. Any suggestion that the tenant should pay more rent for the increased accommodation is immediately met with the reply that he can only pay the present rent with great difficulty, and really requires a few more cows to enable him to do it.

Efforts are being made to increase the consumption, and some success has been achieved and more may be expected in that direction. It is proved by statistics that not enough milk is consumed as food in the British Isles, and that there would be a higher standard of health if a larger use were made of it as such. School children are being supplied much more than ever before, and it is considered there is room for great expansion in this direction. During the year 1934-5 over 2,750,000 school children were supplied. Then very large quantities of milk are used in manufacturing certain commodities outside of food products.

But notwithstanding the efforts the Board is making to get more milk consumed, it is fully aware that the production will continue to increase faster than the consumption. It is now casting longing eyes on the butter, beef, and bacon trades, and great pressure is being exerted on Ministers and members of Parliament to impose import duties on these commodities in the interests of the British agriculturist. It is difficult to see how this pressure can be resisted for very long, and of course it has an important bearing on the export of Australian produce.

The British farmers argue, not unreasonably, that if England were to produce even 25 per cent. of the butter she now imports there might be no surplus of milk, and if a high enough import duty were placed on bacon and ham much of the milk that now embarrasses the Board would be fed to pigs and calves. Further still, a duty on beef would relieve the market of surplus cattle, and the farmer would be better off all round, and would not need to devote all his attention to milk production. It is scarcely to be expected that the British agriculturist will much longer consent to see his butter market so largely supplied from overseas. Britain is now a Protectionist country, and the people on the land will insist on their share of the policy the same or at least similar to that enjoyed by secondary industries. If they succeed in obtaining it, the butter trade will probably be one of the first to be reorganised and, if a substantial duty is imposed, there seems no reason to doubt but that enormous quantities of milk will thereby be absorbed and go into consumption as butter. This would be a great help to the Milk Board.

But it must be pointed out that increased consumption will mean increased production, and as the principal motive for increased production is the artificial stimulus of a fixed price and a certain return in money for the commodity, it seems highly probable that even if all of the aforementioned methods of increasing consumption are brought into operation the Board will be in the same difficulty as it is now.

There is one possible check on increase of production which may operate more successfully in the future than it has up to the present. It will have been noticed that the price of liquid milk was about 1s. 3d. per gallon and manufacturing milk from 3½d. to 4.92d. The practice is that the Board takes all the milk as "liquid," sells to the distributors such quantities as they require for the day, and the balance is surplus milk and sold to the manufacturer. The prices are then averaged out, and it follows that the more "surplus" milk there is the lower the average price will be. This may dawn on the farmers in time, and it is possible that the regional committees may endeavour to regulate the number of cows a farmer may keep, but whether such interference with recognised methods of production and trading will be tolerated remains to be seen.

All of the above economic facts are well known to those statesmen who were responsible for passing the Act under which the Board works, and they are well known to the Board also, but so far as I could gather, the industry, as before stated, was in a bad way, and it was felt that something should be attempted to improve it. The law of supply and demand has a rough and ready way of dealing with over-production of any commodity. Parliament in its wisdom decided to upset that natural law in connection with milk and substitute one of its own. Therefore the new system is an experiment, and must not be condemned before it has had a fair trial.

It is noteworthy that large numbers of the producers themselves are far from satisfied with the scheme. At the Board meeting held in London on 6th June, 1935, which was attended by about 500 farmers, very caustic and heated remarks were made, and some insisted that the whole scheme should be abandoned. The Chairman said that the prices in the present contract showed a substantial improvement, the average price for liquid milk being 1s. 3$^{1}/_{12}$d. per gallon compared with 1s. 2d. for the previous year. Even this statement did not appear to pacify the meeting at all, as several farmers from Devonshire denounced the Scheme, saying among other things that they were being strangled out of existence by it, while another farmer declared that "the scheme contains nothing for us but progressive ruin." Notwithstanding these complaints, however, there seems to be quite a large majority of farmers who, if they do not altogether like the Scheme, do not see anything at present to take its place, and are more or less agreeable for its continuance. No doubt many farmers object to the strict discipline they are subjected to, as it was stated by the General Manager that nearly £6,000 was due to the Board in fines which had not been collected. It is assumed that the multitude of rules and regulations imposed by the Board are difficult to carry out and being sometimes broken, penalties are inflicted which farmers either cannot or will not pay. But this accumulation of fines is not a healthy sign.

POLITICO-ECONOMIC ASPECT.

Some critics roundly condemn the Scheme and call it socialistic. Socialists, on the other hand, declare that there is very little about it that more than even distantly resembles their principles. To make it socialistic they say:—

1. That it ought to be controlled by the State.
2. That there ought to be equality of reward to all persons engaged in it.
3. That the profit if any should go to the State and not to private individuals.

The truth lies between these two extremes. The Scheme is really a mixture of socialistic and private trading, and might be more correctly described as enforced collectivism.

At the productive end of the industry, the farmers are individualists, working entirely on their own account, but restricted in the sale of nearly all of their milk produce to one purchaser, viz., the Milk Marketing Board. At the other end the distributors are public or co-operative companies or private individuals selling to whom they please, but restricted in their purchases as regards milk, to one seller, again the Milk Marketing Board. The Board fixes the price it will pay the farmer; the price at which it will sell to the distributor, and dictates the price at which the latter must sell to the public.

The justification for the Scheme is that no large capitalistic business in these times can be conducted without some elements of socialism (without being bound to an exact definition of that overworked word), and no socialistic business can be made to work successfully if at all without a large share of capitalism. The two things, although at daggers drawn in a general sense, shade into each other at certain points, and it may be that the British Milk Marketing Scheme is the happy medium to reconcile some at least of these conflicting methods of trading.

It may be quite safely asserted that if the Scheme were controlled by the State, and everyone engaged in it a civil servant, the result would be a disastrous failure.

On the other hand, the unrestrained methods of private trading as regards milk have proved unsatisfactory. There are some peculiar features about the milk trade that make it more susceptible to failure in private trading than any other, and this is accentuated in times of industrial crises. Very large numbers of people when thrown out of their usual occupation think they will work up a little milk round, and as they almost invariably start by cutting the local prices so as to get customers, it causes prices to be reduced to such an extent that no one can make the business pay. This, of course leads to unfair forms of competition, such as adulteration and careless, hurried methods of production and distribution. With such a delicate and highly sensitive substance as milk, such practices are not only improper, but are also very dangerous to public health.

In the main, it must have been the above reasons which caused the British Parliament to pass the Act under which the Milk Marketing Scheme was built up and is now operated. Having taken the plunge of initiating a radical change in the industry, it was wise in creating a separate board to control it. That there would be many embarrasing situations and awkward repercussions from such a departure was well known, but it was felt that the industry was in such a desperate condition that it could not be made worse by an experiment.

Up to the present time I think the experiment has been proved to have justified itself. The starting of such a gigantic scheme was a heavy task, and was bound to cause a great deal of friction. Many of the early troubles which arose have been removed, and if the Scheme is allowed to continue commonsense and experience will be the means of removing many more.

CONCLUSION.

The best features that I see in the scheme are:—

1. Unity of control.
2. Improvement in prices to the producer and distributor.
3. A great improvement in the quality of milk.
4. Possibility of more reasonable hours of labour in production.
5. Possibility of more rational distribution.
6. Had there been no Scheme only a small percentage of 2,750,000 school children would have been supplied with milk, and there is the certainty of extension in this direction.

The worst features are:—

1. The danger of over-production caused by the uneconomic stimulus of a fixed price which will, if not checked, gradually force down prices until the dairymen will be as badly off as before. If the prices are kept up vast quantities of milk will have to be thrown away.
2. The fact that farmers are already neglecting other forms of produce for the more profitable one of milk. This is causing increased importation of vegetables and other foodstuffs from overseas.
3. The Government subsidy which can only be excused as a temporary measure but which is likely to be regarded by the industry as an essential for all time.

ACTIVITIES AT ROSEWORTHY AGRICULTURAL COLLEGE, 1935-36.

PART II.—CROP ROTATIONS AND GRAIN HARVEST RESULTS.

[By ALLAN R. CALLAGHAN, D.Phil., B.Sc. (Oxon), B.Sc.Agr. (Syd.), (Principal), and O. BOWDEN, R.D.A. (Farm Superintendent).]

UTILISATION OF FARM FIELDS.

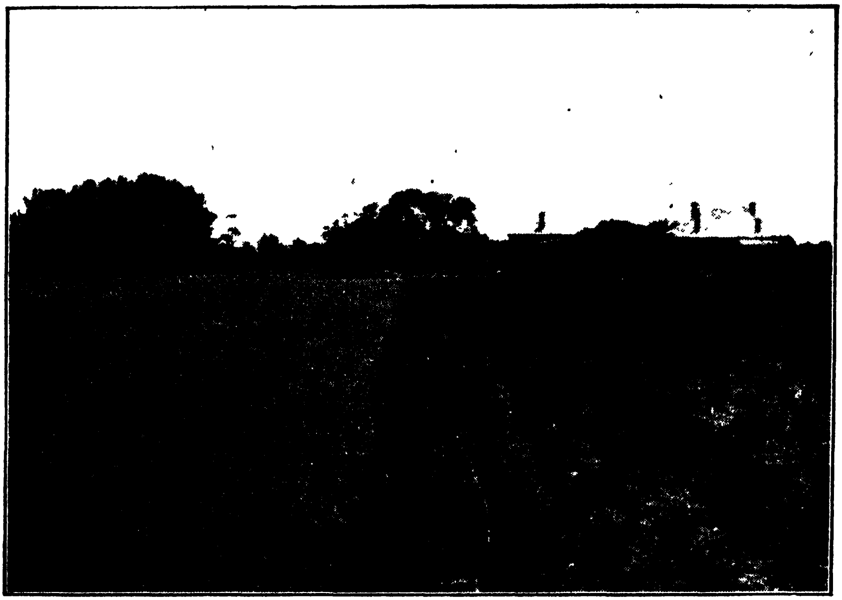
During the last few years every effort has been made to manage the College areas on the basis of a mixed farm in which wheat growing is regarded as the major project. Every consideration has been given and every precaution taken, to avoid the incipient evils of overcropping. To do this livestock numbers have been increased, the rotational system has been extended, and systematic conservation of fodder has been effected. Consequently these three aspects of the work on the College farm have received full report in these annual statements, and they are aspects of farming which might well be commended to the wheat growers of the State in general.

Reference to the accompanying maps, which cover the utilisation of fields over the last two years together with tentative treatments designed for the present year, will give some idea of how the rotational system has been extended. The paddocks Crouchs A and Crouchs B will serve as focal points for discussion. For three years prior to 1934 Crouchs A was rested from cultivation without any pasture treatment. For the same reasons Crouchs B has been rested since 1933, but it has been more fully utilised by livestock because of an excellent temporary pasture, part sown to lucerne and wimmera rye grass, and part to early subterranean clover and wimmera rye grass.

During the three years in which Crouchs A lay as ley land it received no attention. For the first two years some burr medic associated with barley grass made the paddock of some value for winter grazing. By the third year barley grass had taken complete possession and the field was practically worthless as a grazing proposition. The fact remains that the paddock was spared from the plough for three years, until in 1934 it was fallowed, and in 1935 sown to King's White wheat. The value of the rest was clearly shown in the crop which grew with vigour, excellent colour and evenness, a crop which gave no evidence that it suffered in any way from plant food deficiencies, and finally over the 62 acres harvested for grain gave an average yield of 36bush. per acre. It was the best crop on the farm, and its superiority can be largely attributed to the preceding history of the field.

This supplies some evidence at least to the theory that heavy yields may be expected from fields that have been given the benefit of a holiday from cultivation. Granted this, the object should be to rest the field in the most profitable manner possible. To do this, sowing of temporary pastures is strongly advocated. This advocacy is based on the experiences gained from the field Crouchs B which in 1933 was sown to 3lbs. wimmera rye grass and 2lbs. lucerne. On a small portion 3lbs. early subterranean clover were substituted for the lucerne. Every autumn since, the paddock has received 1cwt. superphosphate with the result that burr medic which is a volunteer species, has been a feature of the paddock each winter. On the area sown to lucerne, burr medic and wimmera rye grass have formed a splendid winter pasture and the lucerne has given regular autumn and late spring results, with an occasional very helpful growth during the summer. This is well shown in the accompanying illustration. The area under early subterranean clover has built up well and a good winter association of early subterranean clover and wimmera rye grass has developed, but in this area burr medic has not taken such possession. On the lucerne-wimmera area, the burr medic has been uniformly luxuriant over the last three years and this area of the field has been more productive than the area sown to early subterranean clover. This leads one to assert that where burr medic is a common volunteer, as on the College farm, it is doubtful whether it is economic to sow early subterranean clover. These remarks, it must be noted, are directed to the early form of subterranean clover and not to the late form. Its growth period is short, its production is considerably less and the feeding value of its aftermath does not appear to be as good as the late flowering form. Unfortunately the environment at College with its low rainfall definitely precludes the use of the late form, whereas the early form will grow and seed down readily every year.

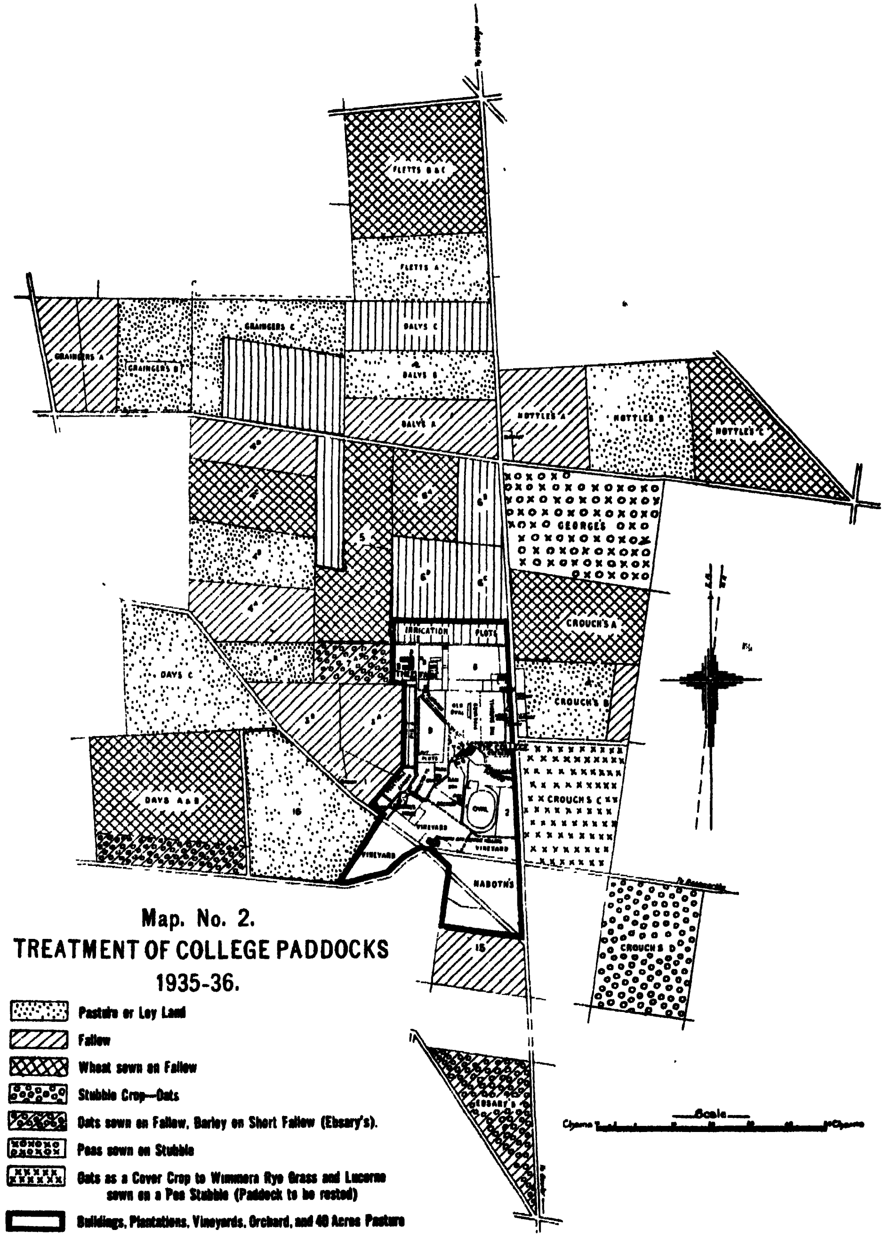
This field, Crouchs B, has just reached the zenith of its usefulness as a pasture and it is only with reluctance that it will be fallowed this year. The field is in its fourth year as pasture, and could well be spared from the plough for two more years, but unfortunately another factor has entered which makes it imperative to sacrifice the pasture, and that is the appearance of initial-cormule plants of Cape Tulip. This weed is not a bad weed on cultivated lands, for cultivation acts as a definite control, but on uncultivated lands it is a menace. Curiously enough its existence in this field was not suspected but the prolonged rest has given the weed a chance to make headway, and although to the average visitor it passes unnoticed, it is present in sufficient quantity to warrant attention. To allay its spread the paddock has been included in the fallow programme for the current year as shown in Map No. 3.



Lucerne in Crouch's B in January, 1936. The line demarcing the area sown to Lucerne and that sown to Early Subterranean Clover was very clearly defined following 175 points of rain early in January this year.

According to programme the next paddock to enter on holidays is Crouchs C. The following is the history of the paddock over the last four years:—1933, wheat; 1934, peas; 1935, oats for silage sown as a cover to 2lbs. wimmera rye grass and 3lbs. lucerne, which constitutes the pasture for 1936 and subsequent years. The establishment of wimmera rye grass by sowing it at the rate of 1 to 2lbs. with the preceding crop is the cheapest and most economical method of establishing this species, but only on the sandier lighter soils and with certain less rigorous oat varieties, has lucerne establishment on this basis been successful.

This year a further step in pasture establishment is being undertaken, and field No. 3 B, which was fallowed last year, will be sown to a mixture of lucerne,



Map. No. 2.
TREATMENT OF COLLEGE PADDOCKS
1935-36.

was delayed until the usual time in spite of the temptation offered by very favourable seed-bed conditions during April. Wheat seeding was not begun until the last few days of April, when a beginning was made with Ford, ideal seeding weather made it possible to sow all other varieties at the right time in accordance with their maturity; early in June, wheat seeding finished with King's White.

The weather during May proved almost ideal; although 1.42in. of rain were recorded for the month falls were light and separated by dry intervals. Rainfall for June, 1935, was below the average of 2.43in. for this month, but the 1.89in. received were very well distributed and of optimum usefulness. The year's rainfall to the end of June was only a few points above average, but its distribution had been unusually favourable, and by July there was a splendid showing of crops and pastures all over the farm. Feed growth was remarkable and all paddocks made up well, so that it was possible to keep the whole of Fletts A closed where self-sown cereal, enveloped with a mat of burr medic, subsequently developed to yield over five tons of volunteer growth to the acre when cut for silage in the spring.

Average rains were received in July and good falls were recorded early in August. A period at the end of August and early September with high temperatures of unseasonable character, accompanied by dry northerly winds, served the useful purpose of hardening the crops and steadied down growth which up till mid-August threatened to be over-sappy, approaching rankness. It was early in August, prior to the dry period referred to, that a local hailstorm of great severity passed over the south-western portions of the farm and caught a crop of Sword in Days A and B in its path. This crop was the pride of the place and the hail, striking it when it was just far enough advanced to suffer severely, cut it to pieces. The dry spell which followed gave it little opportunity for real recovery.

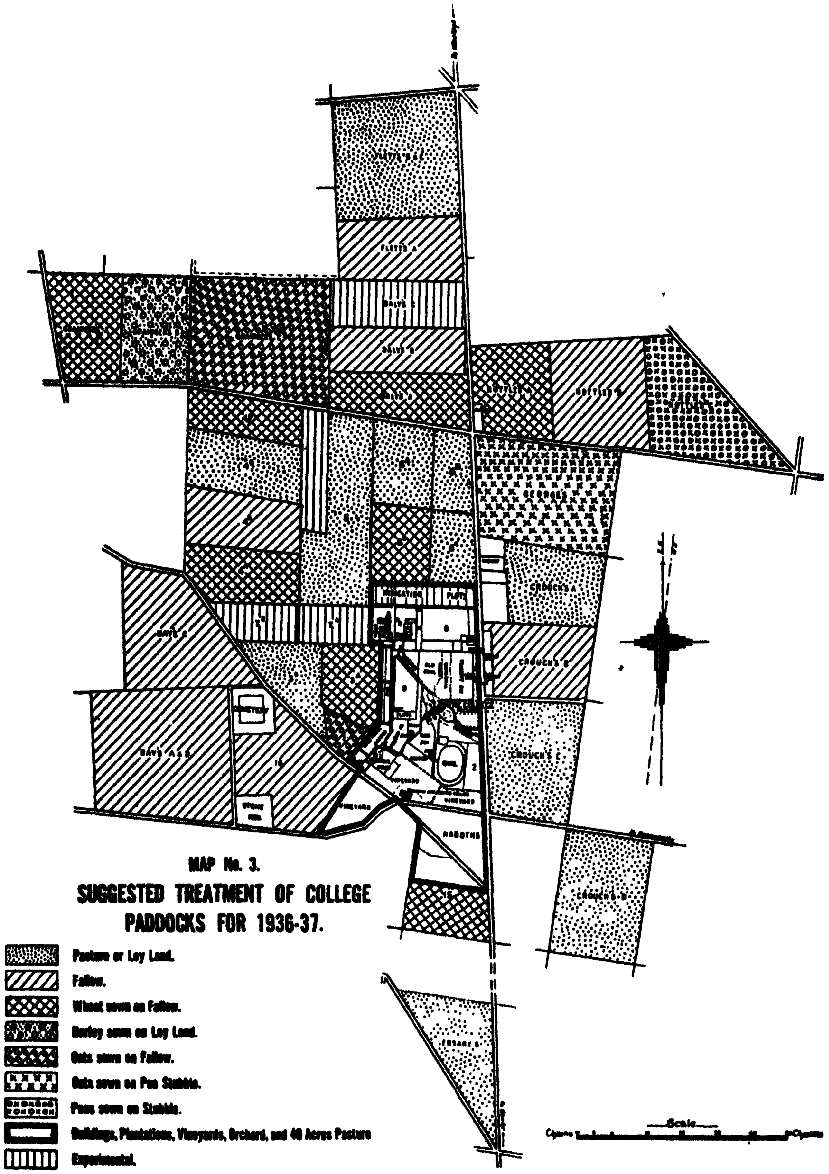
Good rains were very much needed all over the State when they were received with general satisfaction in September. These rains actually assured the wheat crop, and as the season advanced prospects improved. Excellent temperature and moisture conditions soon brought the crops into a forward condition and by the end of September all that was required was reasonable weather in October to assure good results.

Following a fairly long spell of dry weather after the mid-September rains October opened with a threat of bad conditions. For the first few days warm to hot temperatures were accompanied by strong northerly winds and dust. This rather upsetting prelude, however, was followed by a few light showers and cool conditions for some days, so that very little damage was done to the crops. By way of compensation for any such damage which may have accrued opportune rains of great value followed. The weather had unfolded a pleasant surprise; this applied to all parts of the State, for October recordings were above the average and they set free a feeling of optimism and satisfaction as far as harvest prospects were concerned.

As in 1934 finishing conditions were more favourable than usual. The only disturbing feature of the October weather was the effect of wind and rain on the oat crops. Two wind storms were experienced, and one was a heavy hot northerly blow which bent the oat crops over and in places broke the stems about 8in. from the ground. This reduced oat yields and made oat harvesting difficult.

Distribution of Rainfall at Roseworthy College for the Past Six Years, 1930-1935.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov	Dec.	Total.
1930	0·02	0·30	0·01	0·89	0·74	0·77	2·50	2·06	1·03	3·21	0·59	0·75	12·87
1931	0·60	0·10	1·01	1·05	2·80	1·70	2·51	1·86	2·25	0·83	0·47	0·00	15·18
1932	0·34	1·24	1·27	3·73	1·91	3·83	1·73	1·95	1·29	2·73	0·11	0·90	21·03
1933	0·99	0·01	0·94	1·29	2·99	0·74	1·84	2·84	2·24	0·67	0·29	2·01	16·85
1934	0·39	0·14	0·54	2·09	0·19	0·89	0·98	2·49	2·69	2·00	1·65	0·33	14·38
1935	0·91	0·00	1·58	2·78	1·42	1·89	1·59	2·04	2·54	2·41	0·71	0·62	18·49
Mean for period 1904-1935 ..	0·66	0·69	0·87	1·14	2·11	2·20	1·92	2·00	2·06	1·77	1·04	0·88	17·40



MAP No. 3.

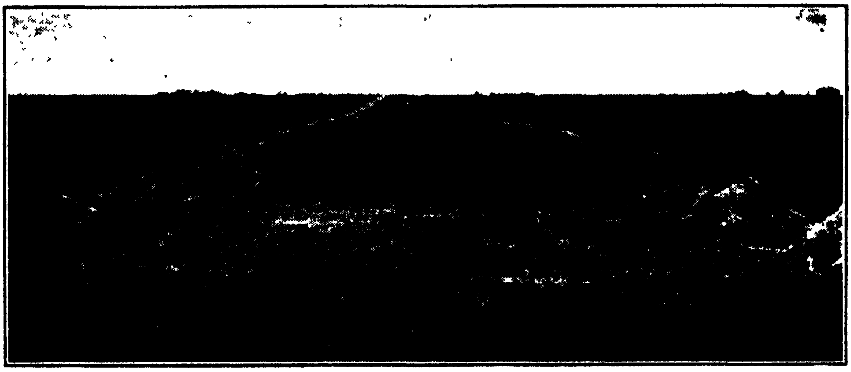
SUGGESTED TREATMENT OF COLLEGE PADDOCKS FOR 1936-37.

From the table it will be seen that the rainfall for the year was 18.49in. which is above the average of 17.40in. Similarly the seasonal rainfall represented by the period April to October inclusive was better than either 1933 or 1934. In both the latter years the rainfall was below average, so that better yields were expected for the 1935 season, and as stated in Part I. of this year's report, the average wheat yield, including the hail damaged crop, was a record for the College at 27bush. 59lbs., and the yield per inch of seasonal rainfall was 1bush. 55lbs.

WHEAT CROPS, 1935.

The areas sown to wheat were, as usual, fallowed land. Fallowing was begun the previous July when the fields were ploughed to a depth of 3in. Conditions were such that two cultivations were carried out with the rigid tyne machines before harvest, then following rains, two light workings with spring tyne implements were necessary, one in January, the other in March; the April rains were followed by a general rigid tyne cultivation, and by then all fallows were in a clean state of tilth ready for seeding.

Seeding was commenced in Fletts B and C with Ford at the end of April and beginning of May, followed by Ranee 4H in Nottles C, Dundee in No. 6A, Baringa in No. 5, Sword in Days A and B, Early Gluyas in No. 5, in that order and finished with King's White in Crouchs A during the first week in June.



Ford Wheat in Flett's B and C, 1935. The illustration shows the Stud Strip with the Pedigree Strips on either side, which in turn are guarded on the outside with Commercial Ford.

Seeding proceeded almost without interruption, the weather at no time interfered, and all seed beds were conducive to ready germination and good establishment. Growth was regular and vigorous right up until mid-August when a dry spell prevented excessive growth. Taking the season as a whole it was kind and favourable to the wheat crops, this applies especially to the weather experienced when the crops were finishing. Often very high temperatures and dust-laden northerly winds pay inopportune visits during the finishing phases of the crop, and while average conditions may prevail in other directions, such scorching and extremely drying days have serious consequences. The October weather of 1935 was free from such extremes, and crops were able to mature full, plump samples.

For a time stem rust was feared and actually appeared in mild form; the dry spell in August had effectively hardened crops and prevented rankness, this, with moving atmospheric conditions during October prevented the development of stem rust in epidemic form. The toll from Take-All in College crops was negligible, in fact very little disease of any consequence was noticed.

The calamity of the year from the point of view of the College wheat yields was the ruination of the crop of Sword by hail during August. The crop had made considerable upward growth and was in the last leaf stage when the storm was experienced. The stems were literally chopped off and to all intents and purposes the crop was ruined. Obviously a crop in such damaged condition should have been fed off, and it probably would have been more profitable to utilise it as cattle feed. This procedure was impossible as the crop was the only Sword wheat on the farm, and upon it the College supply of pure Sword seed was wholly dependent. For the sake of the pure seed programme the crop was allowed to take its chance. At least 75 per cent. of the crop had been cut and threshed to the ground where it withered and died. From the base of the damaged plants fresh shoots appeared later, but it was too late for them to mature good plump grain. The crop did well eventually to produce 14½bush. per acre, and probably 75 per cent. of the grain harvested was obtained from the second growth, and as this had such a short time in which to mature the sample was poor.

The best yield for the year was obtained from the old variety King's White. As mentioned earlier this crop was grown on Crouchs A which had previously been rested from cropping, so that all the credit cannot be given to the variety. It is interesting to note, however, that King's White, since its revival on the College farm, has yielded surprisingly well, in 1934 it yielded 33bush. 4lbs. from 40 acres and last year (1935) it headed the farm results with a yield of 36bush. 38lbs. from 62 acres. From the experiences of the last few seasons it appears that there is no very early maturing variety as suitable as King's White for growth under conditions similar to those pertaining at the College.

Wheat Yields from Farm Areas, 1935.

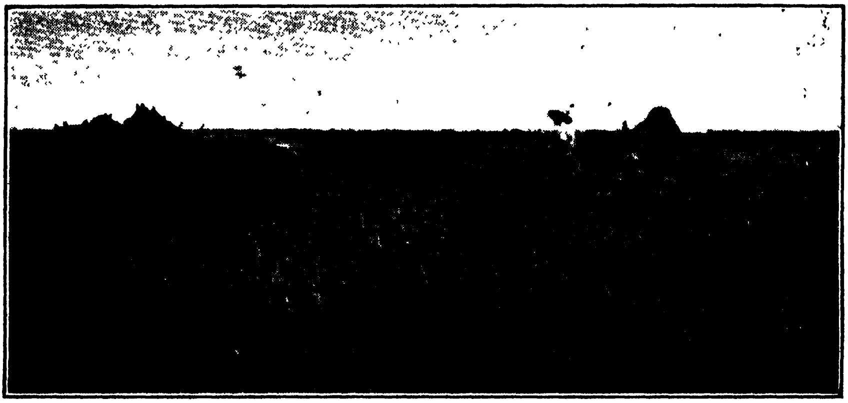
Variety.	Field.	Area in Acres.	Yield per Acre. Bush.	Yield per Acre. Lbs.
King's White	Crouchs A	62	36	38
Ranee 4H	Nottles C	37	30	8
Early Gluyas...	No. 5	23	29	21
Baringa	No. 5	16	28	45
Ford	Fletts B and C	50	27	3
Dundee...	No. 6A	22	23	36
Sword (damaged by hail)	Days A and B	34	14	25

Average yield of wheat, 27bush. 59lbs. per acre—a College record.
Average yield of wheat excluding the hail damaged Sword crop, 30bush. 44lbs. per acre.
Rainfall 1935, 18.49in.; April-October rainfall, 14.67in.
Yield per inch of seasonal rainfall, 1bush. 55lbs.

The variety Ranee 4H again gave good results. In 1934 this variety gave the highest yield on farm areas, namely 35bush. 43lbs. from 55 acres, last year from 37 acres, an average yield of 30bush. 8lbs. per acre was harvested. These yields are sufficient to indicate that the variety is suitable and capable of good results under College conditions; in this respect the variety is much superior to Free Gallipoli which was discarded because of its poor quality.

Of the other varieties Early Gluyas, Baringa and Ford gave satisfactory returns, but the returns from Dundee were rather disappointing. The crop was badly infested with wild oats and this infestation must have reduced the yield somewhat, but even so, the variety seems to prefer heavier soils, and on the light soils of the College farm it may never do as well as it has done in other districts. From localities where the season is longer and soil conditions heavier some very good reports concerning Dundee have been received; in view of these and its reputation as a better quality wheat the variety is being continued on the farm, and in this way the heavy demands for seed of the variety will be met.

Apart from the areas cited above smaller plots of Nawab, Florence and Huguenot were grown. In experiments from which large areas of hay are regularly cut the dual purpose variety Nawab has been found to be the most profitable variety. It yields well for both hay and grain, and for the last three seasons it has performed very creditably. Florence last year shattered rather badly. Shattering was particularly noticeable in many districts last season, but here at College most of the varieties on the farm held well, except Florence. A small area of Huguenot made dense and tall growth, yielding better than usual for this durum type. It stood 6ft. 6in. high and was a very showy crop; in spite of heavy winds it stood well, but many heads were broken off, a factor which must have reduced its ultimate yield considerably. Huguenot is grown to satisfy a small but regular demand for pure seed, as it is grown locally, mixed with oats, as a so-called shandy for hay.



A Student working a Harvester in a 30-bushel crop during the harvest of 1935.

OATS.

The chief objective on the College farm with oats is pure seed production. Farmers throughout the State are appreciating more and more the value of oats for grazing and as the best grain to store for general feed purposes for horses, sheep and cattle. Its place on the farm has definitely grown in importance, and the reflection of this interest is shown in the demand for seed oats from the College. In the past it has been quite impossible to fill the orders, such has been the demand,, and as inquiries are still in excess of the supply, greater attention must of necessity be paid to the crop.

Pure seed work with oats is complicated by the ubiquitous wild oats, and the ready way in which they cross naturally with cultivated oats under the conditions prevailing in the wheat belt areas of Australia. For this reason fallowing for pure seed purposes is really essential, and last season all oat varieties were sown on fallowed areas. Under the circumstances it was realised that heavy grazing of the young crop would be imperative and consequently the oat crops were heavily grazed during June and early July. The nature of the season was such, however, that very even and rapid recovery followed the grazing, and growth conditions were so propitious that exceptional late growth followed. To all appearances the crops would have stood up to normal conditions and some very heavy yields were anticipated, but the wind storms of October, already referred to, accompanied by rain did serious damage. The average yield obtained over the 100 acres of oats harvested for grain was 23bush. 29lbs. Although this yield is above the College mean yield for oats, it was disappointing, but is explained on the basis of wind damage, which lodged the crops and made harvesting very slow and difficult.

In view of the fact that accidental factors prejudiced the yields of some varieties more than others, the individual varietal yields are not tabulated. The best result of the season was from a small area of Fulghum, which yielded 37bush. 13lbs. This variety, curiously enough, has a reputation for weak straw and lodging, but the area was out of direct line of the most damaging wind storm and so it escaped to a large extent. The virtues of Fulghum as a grazing oat are unequalled when early feed and recovery power are taken into consideration. For sheep farmers who need an oat which will stand up to almost continuous grazing Fulghum is recommended. It is a risky oat to grow for hay or grain as it is liable to lodge and is ordinarily not a particularly heavy yielder, but its potentialities as a grazing oat are very great.

A yield of 28bush. 21lbs. was obtained from Mulga, while Early Kherson, over the largest area of any variety, acquitted itself very well with an average of over 26bush. per acre. This result was especially good considering that 30 acres of this variety were from Days A and B, which suffered the visitation of the hailstorm in August. This variety, Early Kherson, stands up better than most oats and can, as as rule, be relied upon in this regard. Other varieties grown in varying quantities were Guyra, Lachlan, Belar, New Zealand Cape and Algerian.

BARLEY.

On a farm where pure seed is a very important aspect of wheat growing, barley has to be carefully handled. For this reason all barley grown on the College farm is now concentrated in one paddock. This applies to experimental plots, plant-breeding rows and farm areas. Last year the field Ebsarys was devoted wholly to barley. This field has received special treatment over the last few years in an attempt to control wild oats, and following a wheat crop in 1933, which was badly infested, the paddock was combined with oats in 1934 and grazed right out. This enabled the field to be ploughed in October 1934 and to be treated as fallow over the summer months. It was brought into good condition by a light cultivation during the summer; this was followed by three cultivations in the autumn and before it was seeded in mid-July, 1935. Actually the desire to continue the efforts towards the control of wild oats prompted the unusual procedure of sowing barley on this short fallow. In 1934 the oats had been grazed very severely and none seeded before the ploughs covered all the remaining growth over in October. To utilise the field and yet not allow the wild oats to gain any ascendancy, it was decided to sow it as late as possible in the season. It was for this reason that barley was chosen. Being the most rapid maturing of all cereals, three autumn cultivations were permitted before it was time to sow. These workings were very successful in destroying wild oats which germinated in the autumn and early winter. This cleanliness was subsequently reflected in the barley crop, which, considering the heavy infestation of wild oats in the wheat crop of 1933 on this field, lent adequate support to the policy adopted.

The crop had just made a good covering of the field when the hailstorm passed over it, but being backward in growth it was not severely damaged, although it received a definite setback which it could ill afford, because of its late seeding. However, it eventually made up into a short but useful crop.

Barley Yields from Farm Areas, 1935.

Variety.	Field.	Area.	Average yield per Acre. bush.	lbs.
Prior	Ebsarys	26	33	42
Californian Cape	"	9	26	22
Roseworthey Oregan ..	"	7	23	19
Tunisian	"	3	20	10

Average yield per acre, 30bush. 16lbs.

The rate of seeding in all cases was 60lbs. per acre, and 1cwt. per acre of super-phosphate was used. The average yield was 30bush. 16lbs. per acre, Prior heading the varietal lists with a yield of 33bush. 42lbs. per acre.

PEAS.

Opportunity is again taken to emphasise the value of this crop on the farm. With livestock taking such a prominent part it is difficult to reason against the more extensive use of peas. True it is that farmers are appreciating the value of peas for summer feed, but the crop could be given more universal attention, at least in the better rainfall areas of the wheat belt. In the report on the College harvest returns for 1934 the value of the grazing aftermath was given prominence and an attempt was made to assess its actual worth. At the time it was considered the figures obtained were high but the really phenomenal results which were obtained last year make one all the more anxious to acquaint farmers who are unaware of the value of the crop with the details which can hardly fail to convince.

Dismissing, for the time being, the actual returns from grain harvested and aftermath grazed, the pea crop is one which should be sponsored by every farmer anxious to increase the efficiency of his paddock rotations. There is no crop suitable for the wheat belt which will thrive so well on soil low in nitrogen. Given a liberal supply of phosphate, and a clean seedbed, the crop will flourish. It can be seeded late, about the end of June or early July after all other seeding, with the possible exception of barley, has finished. In this way thorough destruction of all autumn germinating weeds is effected, the late workings even proving effective on soursobs. Peas enrich the soil in nitrogen because of the properties of nitrogen fixation which their root systems possess in common with other leguminous plants. Then, in addition, droppings from stock during the feeding off of haulms and general crop aftermath have an appreciable influence for good on the soil. Taking all these agricultural features into consideration as well as the direct monetary returns the crop offers, it is difficult to see how the crop can be omitted from the rotation where climatic conditions make its growth possible.

The whole of the paddock, Georges, in all 110 acres, was sown to peas in 1935. In 1934 the field grew wheat. This stubble was burnt off in the autumn and the paddock kept grazed until early in May when it was ploughed to a shallow depth. It was subsequently harrowed and cultivated at the end of May, then cultivated and drilled to 120lbs. of White Brunswick peas sown with 1½cwts. superphosphate early in June. The paddock was then immediately harrowed and cultipacked.

This treatment was effective in killing soursobs and other weeds, consequently the crop made excellent headway and at flowering time, from the outside, appeared to be perfectly clean. Field notes indicate, however, that early in August summer weeds germinated profusely, especially wire weed. By the time the crop was ripe for harvest the wire weed and other summer plants had reached robust proportions. This certainly delayed and made harvesting difficult. The consequence was that a fairly large proportion of the crop was left on the ground. Even so an average yield of 15bush. per acre was obtained and under the circumstances was considered quite satisfactory.

The peas left behind, together with the haulms and abundant wire weed, provided a field of summer feed which would be difficult to equal in this environment. At its best the paddock resembled a lucerne field, the wire weed seemed to thrive especially well, and the paddock was undoubtedly worthy of the envious comments made by visitors who saw it. The grazing results obtained bear this out; for the period January to April inclusive the field carried 3½ sheep per acre. Specifically, 40,911 sheep days of grazing were obtained for the four months, and this is the equivalent of slightly more than 1 sheep per acre per annum for the 110 acres of the paddock.

In view of the nature of the feed and the rapid improvement in the stock depastured on it, an allowance of 3d. per sheep per week does not seem excessive in assessing the grazing value. Granted this and the returns from the paddock can be quoted as worth approximately £413 for the season, or an equivalent of about £3 14s. per acre, based on 1,704bush. of peas at 4s. per bushel making £340, and the grazing of 365 sheep at 3d. per week for 16 weeks making £73. These results were undoubtedly helped by rain in January which freshened up the wire weed, but this fact does not detract in any way from them, as they offer convincing evidence of the direct usefulness of the pea crop on the farm.

THE AGRICULTURE OF NEW ZEALAND.

[By R. C. Scott, Chief Agricultural Instructor.]

(Continued from page 1303.)

DAIRYING IN NEW ZEALAND.

Dairying in New Zealand is practically of equal importance to the frozen meat and sheep-raising industries of that country. Ninety-two per cent. of the total exports are made up by pastoral products, and of these the dairying industry, including butter, cheese, dried and preserved milk and casein can be credited with 45 per cent. of the total value. The principal items as shown in the 1933 statistics are:—Butter, £11,649,000; frozen meat, £9,846,000; wool, £7,422,000; cheese, £4,766,000. From the above figures some idea of the importance of the dairying industry will be gained, whilst as further evidence there is the fact that of the cheese imported into the United Kingdom in the year 1933, 67.7 per cent. was obtained from New Zealand, whilst Canada, which occupied second position, only forwarded 20.7 per cent. Again, in the matter of the importation of butter into the United Kingdom in the same year, 28.5 per cent. and 28.4 per cent. were secured from the countries of Denmark and New Zealand respectively, whilst Australia occupied third place with 19.2 per cent. It is this development of the dairying industry which has been of great economic importance to the Dominion in recent years.

A dairy herd on a Waihati farm. The Jersey is the most popular breed.

DISTRICTS.

Dairying is mainly practised in the North Island, where approximately 80 per cent. of the dairy products of the Dominion are obtained. The chief districts are Taranaki and Auckland. The principal town in the first-named area is New Plymouth, with Auckland and Hamilton the important places in the latter. Whilst these may be described as the principal areas, dairying is carried out on all the lower lands of the North Island.

In the South Island the districts are scattered, but are more concentrated in the vicinity of Christchurch and the fertile lands near Nelson. The main points governing the selection of land suitable for dairying are relatively low altitudes and country preferably of an undulating nature, mild temperatures, fertile soils, together with sufficient and evenly distributed annual rainfall. This even distribution means not only fairly regular rainfall from month to month, but also

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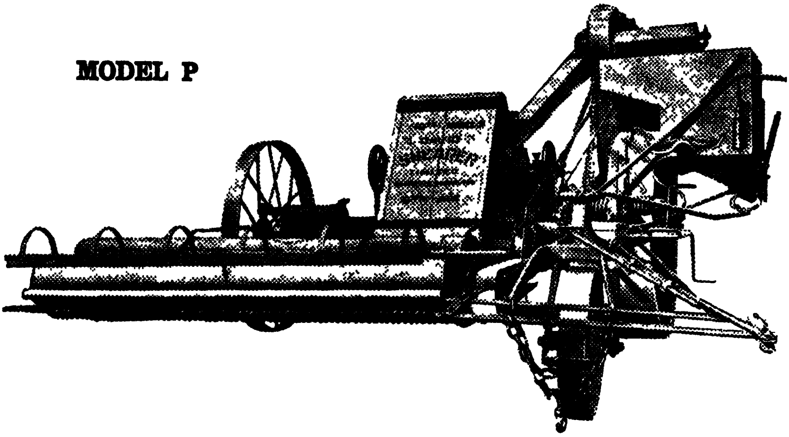

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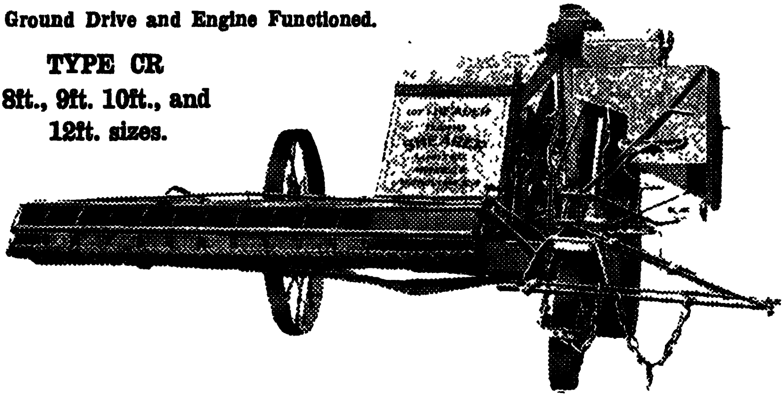

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even distribution throughout each month. As the greater portion of the North Island receives from 30in. to 60in. annual rainfall, whereas on the lower levels of the South Island the normal precipitation is between 20in. and 35in., it follows that the most extensive areas of suitable dairying land are to be found in the North Island.

FARMS.

The greatest proportion of dairying is done on specialised dairy farms, and it has been estimated that about 5,000,000 acres are devoted to this industry. The herds total 75,000, with an average size of 24 cows, but on the other hand 45 per cent. contain 20 or more cows and, therefore, the main dairies may be included in this section. Further, from the point of view of production over 80 per cent. of the total butterfat is secured from what may be described as the larger dairies.

As a rule the holdings are small, and from an investigation into the size of farms in eight typical dairying counties it has been shown that the average dairy farm in New Zealand is about 120 acres in area. In the Taranaki district the mean of 1,030 farms indicated that the average area was 107 acres, and these carried 45 cattle per 100 acres, together with 13 sheep. Similar figures for 1,612 farms in Waikato were 198 acres, 37 cattle and 30 sheep, whilst 456 farms in Waimate West were 111 acres in area and carried 63 cattle and 8 sheep per 100 acres.

Sown pastures are always associated with dairying, and the most striking feature about such pastures is the density of the herbage. Little bare ground is to be seen, and the quantity of feed per unit of area is very great. The main pasture mixture for districts subject to frost and hard winter conditions is a good balance of Perennial Rye Grass and White Clover, whereas in those localities where the winter is not so severe Paspalum is frequently associated with these two varieties. Other fodders such as Cocksfoot, Crested Dog's Tail, and Red Clover are often found in the pasture mixture, but those named are the dominant types.

Roots and other crops do not play an important part on dairy farms, and owners depend upon proper management of the permanent pastures to supply feed requirements. On most farms the permanent pasture is top dressed each season. The quantity applied is not limited, and a mean of a number of high-producing farms was 3cwt. of superphosphate per acre. It follows that if 3cwt. is the average dressing, there are many cases where the application is much heavier, and dressings of up to 6cwt. to 7cwt. of superphosphate to the acre are not uncommon. The usual time of adding the fertiliser to the land is autumn (April or May), although late winter or early spring (August or September) is the popular period with many.

When heavy dressings are being given, the field is usually treated both in autumn and spring. Practically the whole of the top-dressing is in the form of superphosphate. Lime is also applied as a soil amendment, the usual quantity being 5cwt. to the acre in alternate years. Of late years there has been a steady advance toward the subdivision of farms, and the provision of smaller fields. Instances of 25 to 30 paddocks are quite common. On the best farms the aim is to have the fields of such size that the feed can be eaten down in two to three days, which means stocking at the rate of 12 to 18 cows to the acre. The grass growth is permitted to attain a height of 3in. to 4in., and is then stocked heavily for a short period so that the maximum consumption of nutritious fodder is secured before the pasture is fouled. The young and dry cattle follow the milkers, and if these are insufficient to control the grazing, sheep are sometimes used. After removal of this follow-up stock, the paddock is often mowed to cut off the roughage, harrowed to spread the droppings, manured if necessary, and shut up. During the spring when growth is rapid and the feed may get beyond the best stage for grazing, portion of the area is set aside and harvested as ensilage or hay. Ensilage is the more popular form of conserving fodder, and in 1933-34 over 500,000 acres were cut for ensilage or hay.

PRODUCTION.

In 1933-34 the number of cows in milk in the Dominion was 1,933,000, and on a butterfat basis the yield per cow was 220.8lbs. There has been a substantial improvement in this direction over the past 13 years, as in 1920-21 the return per cow was 154.24lbs. In the main dairies the average production per head is from 250lbs. to 275lbs. per cow, whilst the best attain a total of 375lbs. and over. However, correct grassland management and high-producing cows go hand in hand in the raising of returns, and the production is probably best recorded on an acre basis. The average production of all land devoted to dairying has been estimated at 80lbs. of butterfat per acre. On the other hand returns from 550 farms have been collected by the Department of Agriculture in New Zealand, and this survey shows that the average butterfat return from the specialised dairy farms lies between 125lbs. and 150lbs. per acre. If we take the records of the six best farms included in these particulars, it is found that over 250lbs. of butterfat per acre are secured. It is also interesting to note that the highest acreage production was obtained from the smallest holdings. The mean area of the six farms referred to was 85.6 acres, each carrying 74.38 cows, representing a grazing capacity of 0.869 of a cow per acre per annum.

[From *The New Zealand Farmer.*]

The Aberdeen Angus cattle are being largely used for the export trade in chilled beef.

These figures give some idea of the high production of some of the best dairies, and the good general average acre yield of butterfat.

BREEDS OF DAIRY CATTLE.

The latest statistical returns regarding the breeds of dairy cattle in the Dominion were issued in 1928, and in that year the position was as follows:—

	Per Cent.
Jersey	63.3
Milking Shorthorn	22.1
Friesian	12.0
Ayrshire	2.6

From the above it will be seen that the dairy herds consist mainly of Jersey or grade Jersey animals. No particulars have been collected since 1928, but it is certain that the lean toward the Jersey breed has increased since that year at the general expense of the other three breeds, and it is probable that at the present time the number of Jerseys or grade Jerseys approaches 80 per cent. of the total dairy cattle.

The reasons for this breed being so popular are that as it is one of the smaller types the landowner is able to carry a larger number of effective milking cows per acre than would otherwise be the case; he is utilising a breed with high butterfat production; and finally, he is adopting a class of cow which is very early maturing. Whilst many of the herds may be regarded as pure Jerseys—since the dash of Shorthorn or other blood is several generations distant—it was particularly noticeable that almost invariably such herds were headed by a really high-class bull, and in that way a general raising of the standard was being effected.

HERD TESTING.

Herd testing is generally adopted by dairy farmers throughout New Zealand, and 287,000 cows were under test in 1933-34. It was first developed in 1910, and since that year has been increasingly availed of by dairymen. The culling out of inferior stock and the competition following such movement has had good effect in bringing about greater effort, and consequently in raising the standard of production in herds.

Facilities are available for testing both pure, crossbred, and grade cows, and at the present time the cost ranges between 3s. and 4s. per cow.

MARKETING.

In 1933-34 there were 210 butter factories and 274 cheese factories in the Dominion, whilst 45 carried a dual butter and cheese manufacturing plant.

In the earlier days the factories were small, as it was customary to erect a factory for 250 cows, but to-day these smaller factories have been largely absorbed by larger concerns. In view of the number of factories, little of the cream or milk has to be transported over long distances, and an average radius of collection for 60 factories whose areas were investigated by the New Zealand Department of Agriculture was 28 miles, or an approximate district of 175 square miles. Of course, some of the dairy produce has to be transported to a greater distance, and there are instances of cream being railed 200 miles to the factory.

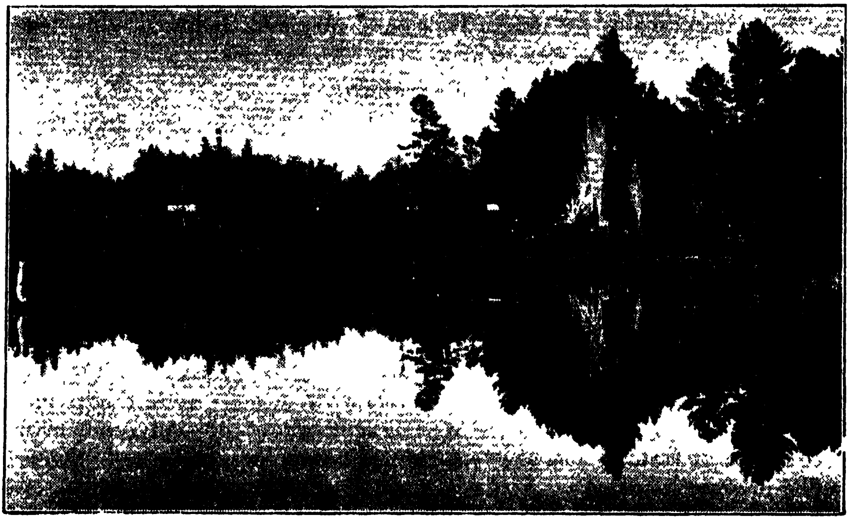
The road and rail faciities for the collection of produce from the farms are really good, and in the main areas it is usually picked up daily, and even in districts situated further from the factory it is seldom less than every second day that the produce is collected.

As a rule, transport of cream is arranged by the butter factory, whilst the delivery of milk to the cheese factories is almost entirely the responsibility of individual farmers. Overlapping in the collection of cream occurs in the same way as in South Australia, and although it is claimed that this competition is to the advantage of the industry, the Dairy Commission of 1934 estimated in their report that there was an annual loss of £150,000 because of overlapping. On the other hand, new regulations gazetted in 1934 made it illegal for a supplier of cream or milk to a factory to transfer his supply to another factory during the same season without first obtaining the consent in writing of the owner or manager of that factory. The dairy farmer is paid on a butterfat basis whether supplying to a cheese or butter factory, and the average prices received of recent years were as follows:—

	Per Lb. d.
1921-30	17
1930-31	12
1931-32	11
1932-33	9
1933-34	9
1934-35	10 (estimated)

In 1920-21 there was a guaranteed price of 30d. per lb. for butterfat, but this only existed for the one season, and in the following year the average price dropped to 14½d. per lb.

The high prices had the effect of increasing land values, and with the steady deflation which followed, the position became serious, particularly for those men on newly-acquired farms which were not in full production. However, the circumstances that arose and the necessity for meeting the obligations incurred have, to a certain extent, been responsible for greater efficiency in the dairying industry. Nevertheless, whilst dairying land in New Zealand is of high capital value to-day, all of it was not purchased in the boom period. The result is that in such cases it is only an assumed value so far as these owners are concerned. The position regarding the sale of milk for human consumption is much the same as in South Australia. The exception occurs in the city of Wellington, where the municipality has a partial monopoly. This monopoly is only partial, as when the regulations were brought into force all dairymen situated within two miles of the city boundary were permitted to sell milk within the city. These men deliver about one-third of the requirements of Wellington, and the remainder is supplied by the Municipal Milk Department. The municipal lorries pick up the milk over a distance of 30 miles, but in the summer time none is accepted further than 20 miles from the depot. On arrival the milk is immediately pasteurised and bottled. It is delivered in the metropolitan area by the municipality, and the city is divided into blocks to prevent overlapping. All payment is made by means of tokens which can be purchased from the Department. The usual practice is for the house owner to place the required number of tokens in the empty bottle to meet the cost of the milk for that day. It is claimed that by the use of tokens bad debts are avoided. Under this scheme the producer obtains 10d. per gallon for his milk, which, after pasteurising and bottling, is retailed at 1s. 8d. per gallon. Conse-



View in the famous dairying district of Taranaki showing Mount Egmont in the background Mount Egmont is 8,260 feet above sea level and is the landmark for aviators flying from Australia.

quently, the consumer does not obtain his requirements cheaper than elsewhere, but, on the other hand, it is generally admitted that there is an improvement in the quality supplied.

A small source of revenue for dairymen which has been built up since 1927 is the sale of vealer calves. This is known as the "Bobby Calf Trade." Prior to 1927 it was customary to slaughter all surplus calves for their skins, but with the development of this trade the dairyman obtains more money for his surplus calf and with less labour. The calves are treated at the freezing works, boned, and packed as boneless veal. On the average each yields about 18lbs. of meat for which there is quite a good market overseas. The trade is governed by regulation, which requires the calf to be at least five days old and reasonably matured. As a rule, the animal is about this age when taken to the freezers, and a fair average price is approximately 7s. per head. As an illustration of the advancement made in this trade there is the fact that in 1933 614,000 calves were treated, whilst in 1934 the number had increased to 954,000.

CO-OPERATION.

Co-operation in the dairy industry is very strong, and practically all the factories, both butter and cheese, are co-operative concerns. The New Zealand Co-operative Dairy Company is claimed to be the largest co-operative company in the world. It has 8,000 members, and maintains 16 butter and 18 cheese factories, one casein, and one dried milk factory. Alone this company handles about 30 per cent. of the dairy produce exported from New Zealand. As a matter of fact, the great bulk of the dairy exports is consigned by co-operative companies, and in 1934 only 8,000 tons of butter and 2,000 tons of cheese were sent overseas by proprietary firms, comparatively with 132,000 and 98,000 tons respectively by co-operative companies.

ADVERTISING.

From levies of 3/64d. per lb. for butter exported and 3/128d. per lb. for cheese, exported, the New Zealand Dairy Produce Control Board obtains its funds. The gross amount collected in 1934 by these means was £81,037. The Board has been effective in bringing about a substantial reduction in freight and insurance rates in recent years, and also in conducting an extensive advertising campaign throughout the United Kingdom. An energetic advertising drive in favour of New Zealand dairy produce was inaugurated in July, 1933, and in seven months £120,000 were spent, whilst in the following year £41,438 were utilised in this way. The result has been that New Zealand butter and cheese are kept prominently before the consuming public, and it was noticeable that any article exported was always clearly labelled with the name "NEW ZEALAND" conspicuously displayed.

BEEF CATTLE IN NEW ZEALAND.

Within recent years the difficulties in connection with the successful shipment of chilled beef have been largely overcome and consequently the industry is more important that was previously the case. Beef is one article which has a greater local consumption than export trade and only about a third of the beef produced is sent overseas. Beef is grown on both pastoral and dairying properties, but that from the latter is largely obtained from steers, surplus cows and a few culled heifers, with the result that this meat is generally tinned and preserved rather than sold fresh.

The hills country is best suited for the raising of cattle, and large numbers bred in these areas are purchased as stores and fattened on the plains. Thus on fat lamb farms and specially swampy lands which are not altogether suitable for milk cows the topping up of beef animals is a regular part of the farming operations.

On the plains a few cattle are generally kept to control the pasture, clean up the ranker feed and maintain the herbage in the best condition for maximum benefit.

In 1934 there were approximately 1,600,000 beef cattle in New Zealand, and 159,233 carcasses were exported overseas.

No statistics regarding the breeds have been collected since 1928, but in that year the distribution of pure bred animals was as follows:—

Aberdeen Angus	4,269
Hereford	4,210
Beef Shorthorn	2,620
Other breeds	116

[From *The New Zealand Farmer*.

Herefords on a North Island farm near Masterton.

Therefore, eight years ago the Aberdeen Angus and Hereford were approximately equal in numbers, but since that time the first-named breed has gained ground at the expense of both the Hereford and Beef Shorthorn, but mainly at the expense of the latter, and it is probable that to-day the majority of beef cattle in New Zealand are either Aberdeen Angus or Aberdeen Angus crossbred.

Their popularity is due to the fact that they thrive in steep and difficult hilly country, they yielded an excellent carcass and either as a pure breed or when crossed with other cattle produce polled, early maturing progeny well suited to the requirements of the country.

The Hereford is regarded with favour in certain districts, as it is claimed that this breed has great capacity to recover from any check due to cold wintry conditions, and in this respect both the Aberdeen Angus and Hereford animals are better than the Shorthorn.

SHEEP IN NEW ZEALAND.

The climate of New Zealand is well suited to the raising of sheep, whilst the perfection of refrigerating machinery altered the whole position so far as the industry was concerned. Prior to improvement in this direction practically the only exports were wool, tallow, and hides, but to-day with the export of frozen carcasses, sheep raising is the most important primary industry, and in 1934 the value of the products exceeded £23,000,000.

Some idea of the extent of the sheep industry in the Dominion can be gained from the following statistics:—

Sheep Industry Season, 1934.

Total number of sheep	28,649,038
Lambs exported	8,719,301
Mutton exported	2,010,084
Lamb consumed locally	106,121
Mutton consumed locally	1,546,050
Wool (lbs.)	300,500,000
Value Meat	£8,757,144
Value Wool and Skins	£14,700,663

DISTRIBUTION.

Sheep are well distributed throughout both Islands, the actual numbers for each being approximately equal.

Where the rainfall is fairly high and the altitude not too great dairying is mainly practised and sheep are pushed back to the higher levels, but on the lower lands where the rainfall is less sheep are chiefly kept, and this class of country is the main fattening area for export lambs. However, practically all farms carry some sheep, even if dairying is the principal source of revenue, and they are generally distributed throughout the occupied area of the Dominion, with the greatest population in the Hawke's Bay and Wellington districts.

BREEDS.

On high country in the South Island, where snow falls regularly each season, and the pasture is of a poorer type than elsewhere, it is necessary to keep the most hardy breed of sheep. Under such circumstances the Merino is kept because of the extra value of the wool. Consequently, it is found that in the South Island Merinos comprise 9 per cent. of the total number, but on the other hand only 0.2 per cent. of the sheep in the North Island are of this breed. The Romney Marsh is of the greatest importance in both Islands followed by the Corriedale and Southdown breeds. The sheep may be classified into two groups, namely registered and other pure breeds, and cross and half-breds. The latter group represents about 80 per cent. of the sheep of New Zealand, and in 1934 there were 22,760,901 of this type, comparatively with 5,888,137 pure bred animals.

A Crossbred is any long woolled sheep of mixed breeding, whilst a half-bred is a straight cross between a Merino and a Long wool. However, the latter type is not very numerous, totalling 2,199,542.

The Crossbred has been built up from the original Merinos, since the latter breed did not thrive in the heavy rainfall districts. In the early days English Leicester, Lincoln, Romney Marsh, and a few Cheviots were used, and it was the systematic inbreeding of the Merino-Longwool half-bred which resulted in the production of the Corriedale. However, in the development of the present-day Crossbred the Leicester was the first to drop out of favour, whilst with the poor demand for strong wool the Lincoln lost ground, leaving the mating chiefly to Romney Marsh

[*Photo. New Zealand Tourist Bureau.*

A Scene on a North Island Sheep Farm, showing the type of Crossbred Ewe being mated with Southdown Rams, for the production of export lambs.

rams. Therefore the New Zealand Crossbred to-day is principally of Romney Marsh blood, although in many cases Lincolns, Leicesters and Merinos may be included amongst their ancestors.

Attention has been directed toward conformation rather than quality of wool and there is considerable variation in this connection. The average count is from 46 to 50 whilst that from the half-breds reaches a maximum of 56.

The percentages of the different breeds of pure bred sheep in New Zealand are:—

Romney Marsh	52
Corriedale	22
Merino	18
Southdown	5
English Leicester	1
Border Leicester	1
Lincoln Ryeland Shropshire	1
Total	100

From the above figures it will be seen that the Romney Marsh is far and away the most important pure breed in New Zealand, and has attained that position because of its suitability to the climate and resistance to foot rot. The majority of stud flocks are Romneys, and the flock rams from these are used as sires in the production of crossbred ewes which form the basis of the fat lamb flocks.

A really good class animal has been built up possessing a well-shaped body and with fairly fine bone. They are somewhat variable in the wool, but nowadays more attention is being paid to this question, and general improvement in the near future is anticipated.

The Corriedale is also fairly popular and when mated with the coarser Crossbred yields progeny with finer wool than their mothers, whilst at the same time there is no loss in conformation. As has been said, the Merino is confined to the colder and poorer pasture areas of the Southland because of its suitability to such conditions, whilst the Southdown is practically the only mutton breed used.

It follows, therefore, that breeds used for the production of the export lamb in New Zealand are almost entirely the Southdown as the sire, and the Crossbred or Halfbred as the dam.

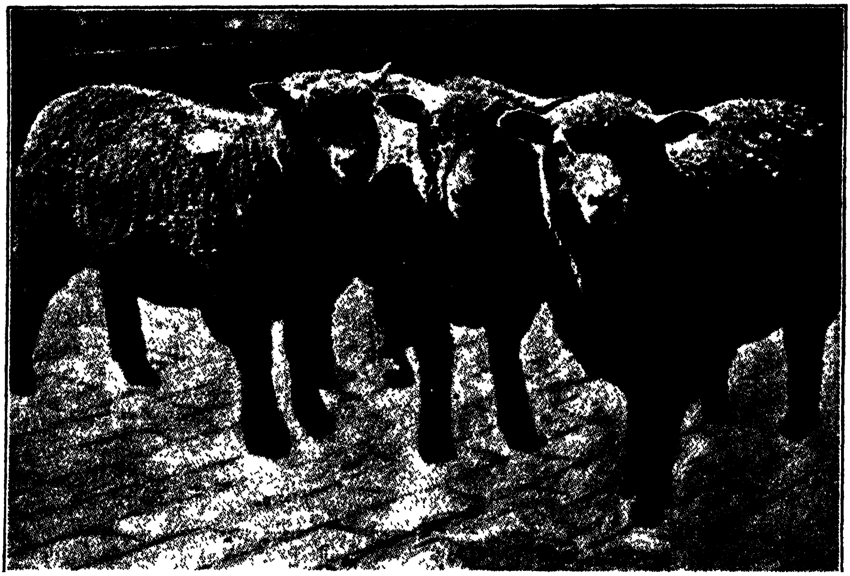
MANAGEMENT.

There are some large flocks of sheep in New Zealand and the average size is 961, but this figure is reached because of several large holdings and approximately half the sheep are held in flocks of under 500, and three quarters in flocks of under 1,000. Therefore, generally speaking the flocks are small, and careful and constant attention is possible.

In the mountainous and dryer areas of the South Island the winter is cold and snow is regularly experienced in many localities, with the result that there is usually a high mortality, particularly with the breeding ewes. As a consequence it is a regular practice to only mate sufficient ewes to keep the flock up to strength. The Merino is the breed kept in this country, and whilst wool of fine quality is grown, the fleece is light, about six to seven pounds, and the animals small. There is little doubt that the introduction of large-framed, strong constitutioned sheep from some of the South Australian studs would lead to improvement in the class of Merino now being carried.

In the hills country of both Islands Crossbred flocks are held and both wool and meat raised. Animals from these flocks form the basis of the fat lamb breeding flocks of the fattening farms. The ewes are mated to Romney Marsh or Corriedale rams, and whilst in some cases a high percentage of the progeny can be fattened on the farm and sent to the meat works, as a rule the greater proportion is sold as stores to graziers for topping up, whilst the ewe lambs are retained on the farm for breeding purposes. Such ewe lambs replace the older ewes sold to the fat lamb breeders on the lower levels.

The fat stock farms are situated in areas which either because of altitude or rainfall are not well suited to dairying, and except for stud flocks these invariably hold Crossbred ewes purchased from the hills. They are bought in early autumn, usually when full mouth, costing about £1 per head. At times only one lamb is taken from them before disposal, but as a rule they are kept for two seasons. Large annual ewe sales are held, at which lamb raisers secure their requirements, but when a breeder is obtaining full satisfaction from the line of ewes he is using, he invariably endeavours to make his future purchases from the same source.



[*From Agriculture in New Zealand (Mr. Spafford).*

Typical Export Lambs.

There are, therefore, three main classes of sheep farms, namely, the Merino farms, the hills farms, and the fattening farms, with a definite linking up between the two last-named, as the fattening farms obtain their ewe requirements from the hills, and top up the surplus and wether lambs on their better pastures and supplementary crops.

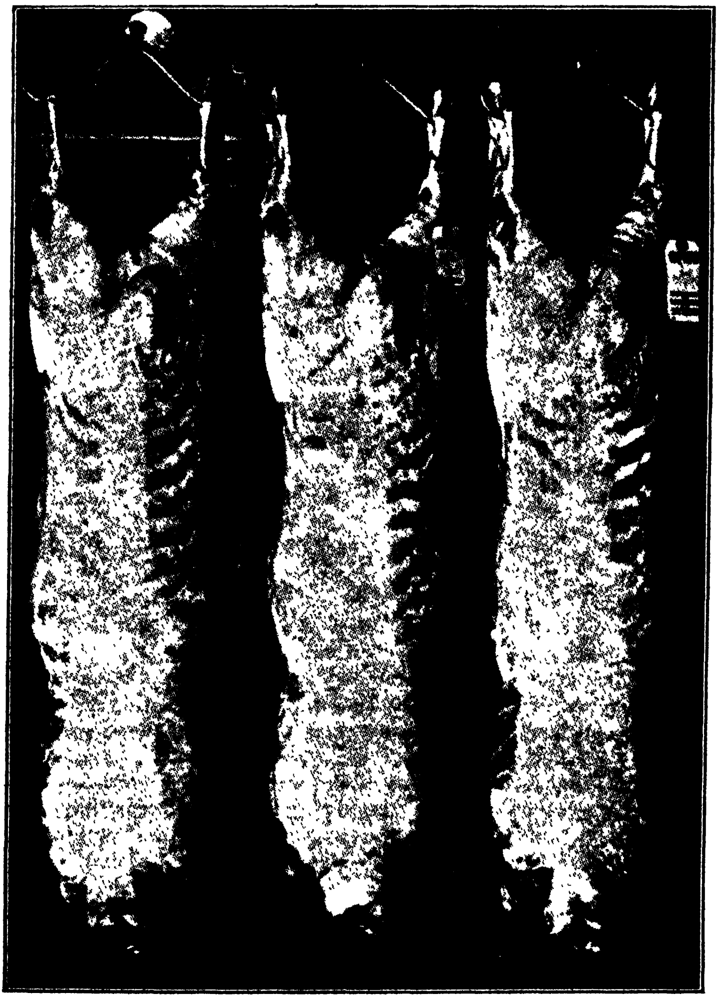
The result is that amongst the crossbred sheep few wethers are retained, and an analysis of the sexes over the whole of the sheep population shows that there are approximatey 65 per cent. ewes, 24 per cent lambs (mainly ewes), 9 per cent. wethers and 2 per cent. rams.

The average lambing is almost 90 per cent., but that for the fat lamb breeding flocks is invariably higher, with under 100 per cent. an exception, and up to 130 to 140 per cent. not uncommon. This high natural increase appears to be due to several reasons. The Crossbred ewes are naturally prolific, the change from the hills country to the better feed of the plains results in flushing and greater fertility; the rams used are young, vigorous, and at least two added to every hundred ewes, whilst close attention is given to the flock throughout lambing time.

Most lambs are dropped during September and October, and from the fattening farms practically all are sent to the freezers direct from their mothers. However, this is not the case with the surplus lambs from the hills, and about 20 per cent. of the lambs exported from New Zealand are weaned and topped up on other pastures prior to slaughter.

MARKETING.

Because of the large export trade the local prices are governed by export values. Consequently there is practically no breeding specially for the local trade as is the case in South Australia.



[*From Agriculture in New Zealand (Mr. Spafford).*

Carcasses of first quality Export Lambs.

Very great care is taken in the selection of the lamb for the freezers, and as a rule each animal is handled before being marked for disposal. Every breeder endeavours to forward only prime lambs dressing between 32lbs. and 36lbs., and if a lamb does not reach the standard set it is kept on the farm until ready. The animals are mainly transported by motor lorry and as far as possible every animal is dressed on the same day that it leaves the farm. Rapid transport and slaughter is possible because there are 35 freezing works conveniently situated to suit the producer. A seaport is not regarded as essential, and some are over 100 miles from a port. In such cases the carcasses are taken on to the ship in insulated cars. Twenty of the meat works are in the North Island and 15 in the South, whilst all except two have adopted the chain system of handling.

The average killing capacity per day is about 3,725 sheep and 130 cattle, whilst Petone in the North Island is the largest, being capable of handling 10,000 sheep and 100 cattle daily.

The farmer may market his export lambs under several systems, namely:—

Under schedule
By sale direct on farm, truck or works
Export on own account
At livestock markets

Sale under schedule is the usual method, when the farmer is paid a definite amount per pound according to the weight and quality grade of each carcass, whilst the works retain skins, offal, &c. Next in order of popularity is per head on the farm, trucks, or delivered at the works; whilst some may be exported on the farmer's account, but very few pass through the saleyards to be purchased by export houses.

The standard of inspection for export meat is high, and no carcasses are sent away showing any defects or disease. Every meat works must supply a daily return to the Department of Agriculture indicating the causes for rejection, so that the trouble can be investigated.

The grading is carried out on a standardised system set by the Meat Board, although each works has its own private brand.

The grades are:—

First Quality Lamb—

2s	Up to 36lbs.
8s	37 to 42lbs.
4s	43 to 50lbs.
Tegs	Over 50lbs.

Second Quality Lamb—All weights.

In addition some works divide the first grade lambs into Downs and First Quality, the Down being an almost perfect carcass.

There are no third grade carcasses and any failing to reach the second quality are consumed locally. As evidence of the care taken in marketing there is the fact that of the 9,000,000 lambs exported last year 85 per cent. were graded as Down or First Quality carcasses.

Because the great majority of these lambs are sired by Southdown rams from a uniform type of ewe, there is a great regularity in the conformation of the carcass obtained. It is this uniformity and evenness which is the striking feature of thousands of carcasses hanging in the cooling and freezing chambers of the New Zealand Meat Works and is a marked contrast to that which may be seen on almost any day at the Port Adelaide Depot.

An export market in mutton has been established and the cull ewes from the lamb breeding flocks are disposed of in this manner. When the lambs are weaned these ewes are topped up and sent to the freezers, the average price realised during the past season being about 14s. per head.

The grades into which these carcasses may be placed are:—

First Quality Mutton—

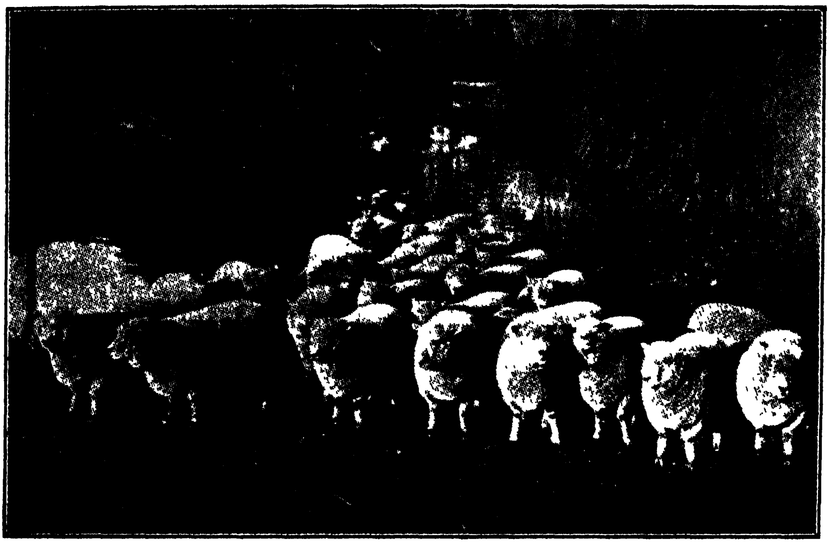
1s	Up to 48lbs.
7s	49 to 56lbs.
3s	57 to 64lbs.
9s	65 to 72lbs.
5s	73 to 80lbs.

Second Quality—All weights.

Practically the whole of the lamb and mutton is exported to England, with a very small proportion to the Pacific Islands.

Since its appointment the Meat Board has concentrated on advertising and propaganda work. All the first grade carcasses are attractively labelled, and everything possible is done to draw the attention of the consuming public.

The season is much later in New Zealand than is the case with Australia and South Australia in particular, and New Zealand meat chiefly reaches the United Kingdom from February to August, whilst almost 60 per cent. of that from Australia is sold during the months of November, December and January, a fact of distinct importance to us.



[*Photo., The New Zealand Farmer.*

Stud Southdown Ewes on a Canterbury Farm.

WOOL.

Wool is the most important single commodity exported from New Zealand, but it gains its value from the total quantity produced rather than the quality of the produce. The average fleece is only a little more than 8lbs. and is of the Crossbred type.

Breeders have concentrated more on carcass than on the wool, because of the relative value of meat and wool, and in order to secure heavier fleeces have tended to use stronger woolled Romney Marsh rams. At the same time hairiness developed, and complaints were received from overseas manufacturers on this account. Hairy fibres, unless very coarse, are not easy to detect, and it was realised that some simple test which stud breeders could utilise was necessary for the selection of animals and the improvement of the wool.

The problem was taken up by the Department of Agriculture and continued at Massey Agricultural College, with the result that what is known as the Benzol test has been evolved.

This test is based on the fact that pure wool is solid, whilst hair is hollow. Pure wool and benzol have nearly the same refractory index, and therefore if wool is immersed in benzol it is rendered practically invisible, whilst hair shows up as a white thread owing to the hollow space.

The apparatus is simple, being merely a shallow tray about 10in. x 8in. coated with black porcelain enamel, into which a piece of plate glass will lie with about half-inch space at the edges. The sample of wool is washed in petrol to remove the dirt and grease, and after teasing out to a thin layer about six inches wide, is placed in the testing tray. The benzol is added and the wool held down with the glass cover. The hair is then seen standing out white and clear against the black background, whilst the wool is invisible.

Whilst the percentage of hair can be estimated by comparison with photographic standards, a photo-electric test has been perfected at the College, which accurately measures the amount of hair present.

The College will test animals for breeders, and the opportunity is being freely availed of. The laboratory is working at full pressure, and some thousands of samples are being examined annually.

From rams 18 samples of the wool are cut, six from the hind quarter, six from the side and six from the shoulder. These are tested and the animal classified according to certain standards fixed upon. With ewes, hoggets and lambs only six samples are taken. Usually the whole flock is done, and as each animal must be marked, the subsequent report and classification assists in culling.

The charge for these tests is 3s. per head for rams and 1s. for other sheep, plus travelling expenses for the collection of samples.

Definite results are being obtained following the mating of tested animals, and there is little doubt that the Benzol test will quickly lead to improvement in the wool quality of the Romney Marsh breed, and consequently the quality of the fleece from the Crossbred sheep.

The work so far has been confined to Romneys, but there is no reason why it cannot be applied to other breeds, and may even be of value to Merino studs in this State.

DISEASES.

A number of sheep diseases occur but are rarely permitted to become serious, because of the careful and efficient precautionary measures taken. For example:—The fattening country is not particularly healthy, but by the purchase of full-mouthed ewes, and their disposal for export as frozen mutton after one, or at the most two seasons, followed by replacement with healthy animals from the hilly country, serious losses are avoided.

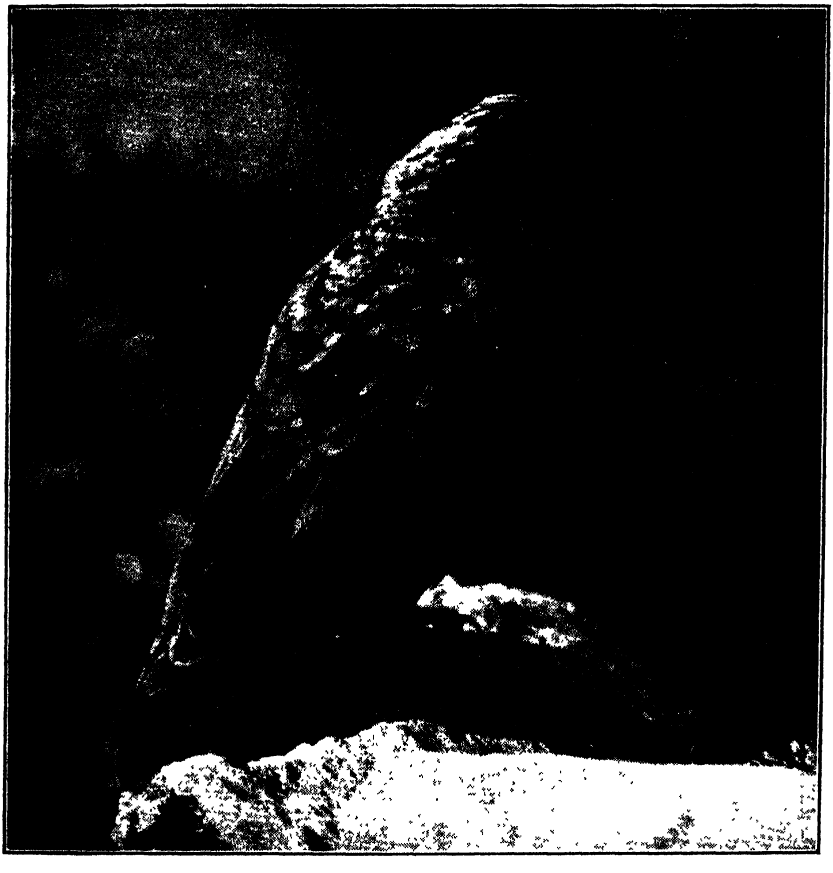
Again, in the case of footrot, stockowners do not wait for the disease to become prevalent throughout their flock, but pare the hooves and pass the animals through foot-baths in late summer. In this way the danger of infection from diseased sheep which carry the germ throughout the year and thus reinfect the grazing fields, is reduced.

It is the early treatment and precautionary measures with stock troubles generally, which is the outstanding feature in keeping disease in check in New Zealand and is an example which could be followed with advantage in South Australia.

Whilst the Romney Marsh sheep is resistant to footrot it is not immune, and this disease is one of the most troublesome in New Zealand. Treatment commences in late summer, at which time, although a few animals may be lame, the flock is not seriously affected. The feet are trimmed, wounds dressed, and the animals run through a foot-bath. In some cases a proprietary arsenical mixture is used, whilst in others a concentrated solution of copper sulphate or formalin is preferred. The treatment does not materially differ from that with which we are familiar, but the important point is that action is taken early in the season, and if necessary regularly continued.

Stomach worms constitute one of the most important troubles and drenching with a solution of bluestone and black leaf forty is the regular treatment. Pulpy kidney is a wide-spread disease amongst lambs born on the fattening country, particularly when the pasture is not properly controlled. The trouble appears to be associated with over nutrition and lack of exercise, and the usual treatment is to yard the flock for about 24 hours every five to six days until the mortality ceases.

Fatty gland, or caseous lymph-adenitis, which is a serious cause of rejection of export carcasses in South Australia, is not prevalent in New Zealand. On farms where it has been located, the infection has not been severe, and by the culling of affected animals and the disinfection of shearing machinery, &c., the spread has been checked, whilst officers of the Veterinary Department are of the opinion that with care the disease will be eliminated.



[*Photo., New Zealand Tourist Bureau.*

The Kea Parrot, an inhabitant of the mountainous country of the South Island. It attacks sheep, eating into the kidneys, and almost invariably causes injuries which prove fatal. Fortunately, the birds are rather rare nowadays.

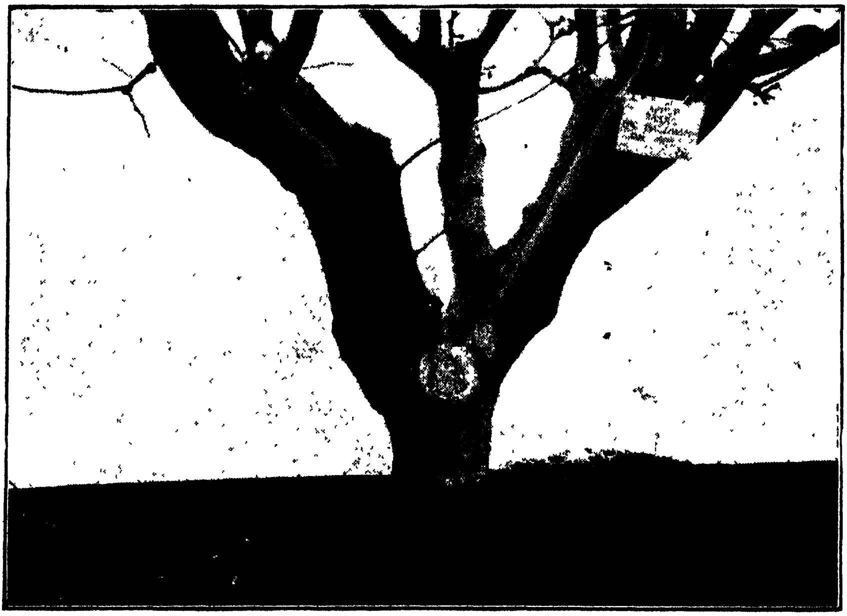
There are several areas where mineral deficiency occurs, chief of which is the pumice land of the North Island, and in this country iron licks are being used with success.

(*To be continued: the next portion of this report will deal with Pigs in New Zealand, wheat and other crops, and will conclude with Impressions and Summary.*)

REWORKING FRUIT TREES.

[By R. Fowler, Manager Blackwood Experimental Orchard.]

In many of the old established orchards in South Australia, numerous varieties of apples and pears are to be found which a decade ago were regularly shipped to overseas markets and realised at that time remunerative prices. With the extension of planting in South Australia and other States, however, and the entry of other countries into the apple and pear export trade, very keen competition has developed, which has shown that many of the old varieties cannot reasonably be regarded as having any commercial future. As the list of varieties now favoured for export has been reduced to about 40, with the possibility of this number being still further reduced, growers are now confronted with a very important problem—the elimination of the unsuitable or unprofitable varieties from the orchard. It may be possible to retain a few of these, for which a profitable outlet can be found on local or interstate markets, but in the majority of cases, it will be found preferable to convert the trees to more popular varieties that can be used for either local or overseas trade.



[*Photo.*, *E. W. Pritchard.*

Fig. 1.—Limb removed owing to attack of *Polystictus versicolour*. Wound healing without further spread of infection.

Where a large number of trees is involved, the problem is a very serious one and resolves itself into the choice of either conversion to the desired varieties or grubbing out and replanting; the latter course will not commend itself to many growers. The loss of time, the cost of bringing other trees to the productive stage and the difficulty of establishing new trees in a bearing orchard preclude any possibility of this course being adopted extensively, so that the grower is practically forced to adopt some method of grafting or refurnishing.

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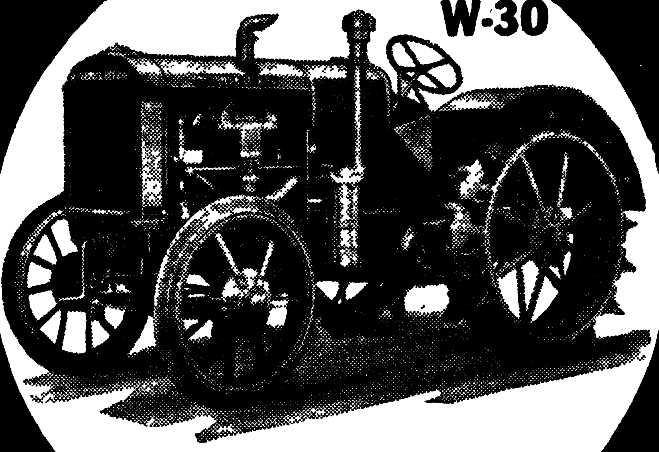

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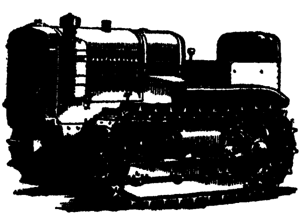

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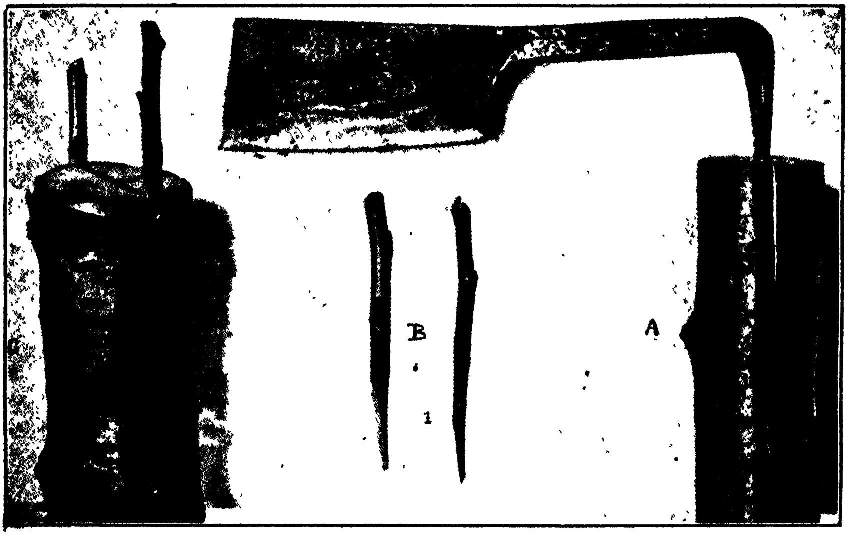
In the past, various methods of reworking by inserting grafts on the main limbs severed just above where they branch out from the main trunk were favoured, but the prevalence during recent years of *Polystictus versicolour,* a wound fungus which has caused considerable loss and injury to trees cut hard back in this way, has made it necessary to seek other methods of conversion or reworking.

Polystictus versicolour is a disease which has not yet been controlled with any measure of success. It generally attacks trees at large open wounds, particularly if these are situated on the main limbs, such wounds apparently offering ideal entry for the fungus. No effective way of treating the established fungus is known, and the only safe procedure is to cut out the infected area or amputate the limb showing signs of infection. This must be done at once, as infection travels fairly quickly down the limb, and once it has entered below the crotch, the chances of saving the tree are small.



[*From Brit. Min. of Agric., Bltn. No.* 2.

Fig. 2.—Top Grafting.—Cleft Grafting.—A, the branch of the stock is split transversely with a chisel of chopper. B, the grafts, with long, oblique surfaces cut on each side of the stock bud, B1. These are inserted in the cleft in the stock C, bound with raffia, and then waxed or "pugged."

One large limb of the tree shown in Figure I. developed *Polystictus* after being worked over in 1928. The limb, a very large one, was immediately removed, the wound disinfected and painted, and no further spread of the infection has been noted

The risks of infection appear to be considerably reduced if the reworking is done higher up along the main limbs, small wounds callousing over more readily than large ones.

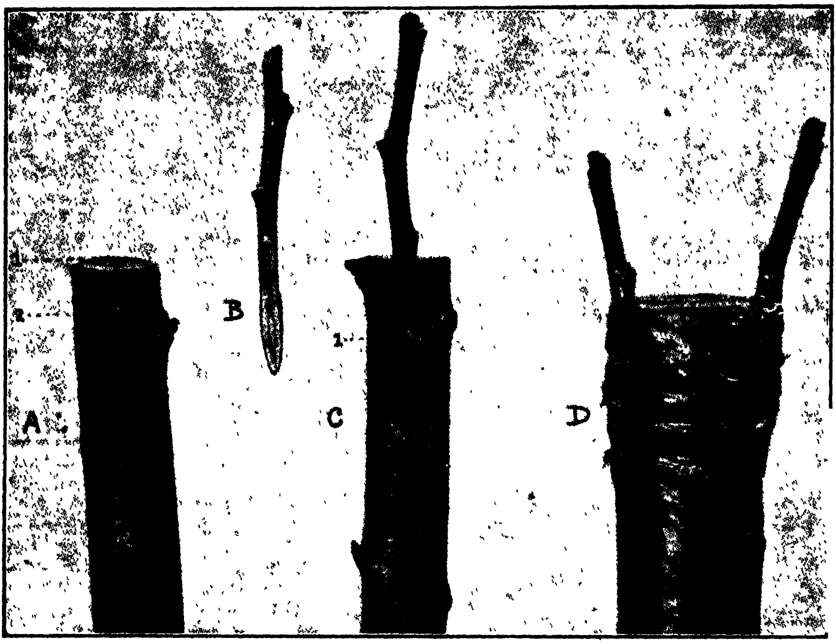
Under the old method of reworking, large trees in full bearing often took 3 to 4 years before there was any crop return, but under modern methods this serious loss of time is obviated and the production period is not shortened to any great extent.

From experience gained during the past few years and a careful study of all the factors involved, it is now possible to recommend methods of converting unprofitable fruit trees to more profitable varieties, which are applicable to most types of deciduous fruit trees, and which will eliminate some of the difficulties already enumerated.

So that a fair comparison of the various methods of changing varieties can be made, the first portion of this article will review methods which have been in general use for some time. More modern developments will be dealt with in subsequent sections.

GRAFTING.

Grafting may be described as the causing of a scion, comprising one or more buds cut from one plant, to become part of another, called the stock. There are many ways in which grafting may be effected, but the same principle applies to each one. To effect a union between stock and scion, the cambium layers which are situated just beneath the bark must be brought in close contact, and air and other foreign substances excluded.



[*From Bltn. No.* 2, *Brit. Min. of Agric.*

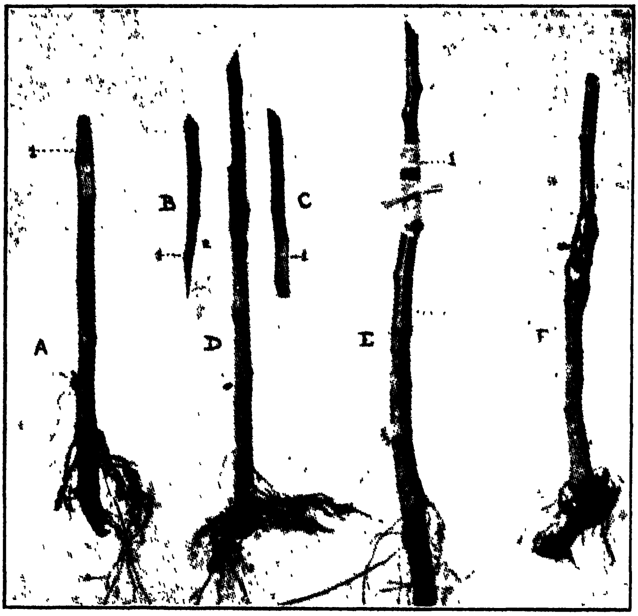
Fig. 3.—Top Grafting—Rind or Bark Grafting.—A, a branch of the stock prepared to receive the graft; A1, the pared surface at the top of the branch; A2, the longitudinal cut in the rind. B, the graft. C, the graft slipped beneath the rind of the stock; C1, the stock bud. D, the operation completed. The grafts have been bound to the stock with raffia, and all the cut surfaces have been waxed.

It is not necessary that the cambium layers should meet perfectly in all parts of the cut surfaces of stock and scion, but the more perfectly they are brought in contact, the greater the chances of fusion between stock and scion. The success of the operation of grafting depends largely upon the smoothness of the cut surfaces of the parts brought in contact and the accuracy of the joining.

Scions should be cut from well-ripened, mature wood of the previous season's growth. They should be cut in winter and well before the buds swell in spring, and should be kept partly buried in moist sand or covered with damp bags or litter in a cool, shady place, as it is necessary that they should remain in a more or less dormant state until required. It is generally conceded that grafting is usually more successful when the stock is in a more advanced stage of vegetative activity than the scion, and the operation is therefore best done in early spring when the sap is moving freely in the stock.

The different styles of grafting may be classified in respect to the place where the scion is attached to the stock, as Root Grafting, or the insertion of the scion in the root of the stock, used in nursery work; Crown Grafting, or the insertion of the scions in the stock at the surface of the ground; Stem Grafting, or the insertion of the scion in any part of the main stem or trunk, and Top Grafting, or the insertion of the scions in the top or branches.

Grafting may also be classified in respect to the way in which the union between the scion and the stock is made as Cleft Grafting, Bark Grafting, Whip Grafting, and Strap Grafting, &c. The variety of methods is due mainly to the differences in the sizes and ages of the stocks, and no practical purpose would be served by describing all the modes of grafting that are practised, as in many cases there are but slight differences, often more fanciful than serviceable. The four methods just mentioned are those generally used and they are ample for most requirements.



[*From Bltn. No. 2, Brit. Min. of Agric.*

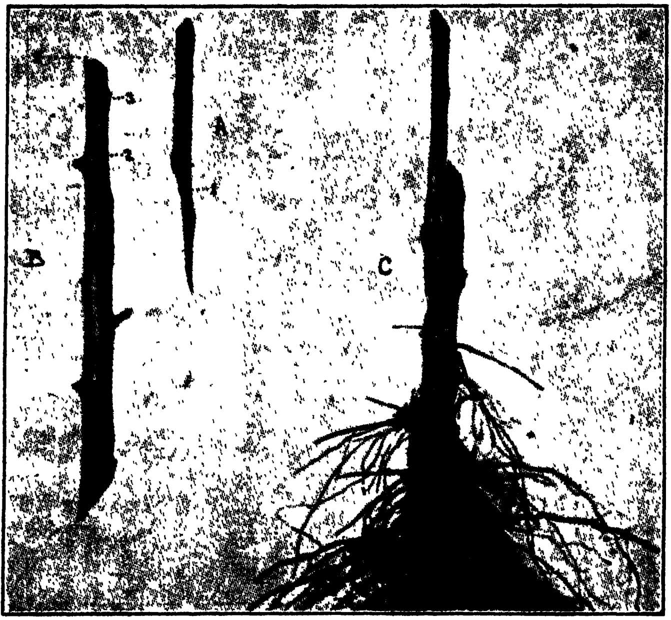
Fig. 4.—Whip Grafting—Graft and Stock the same size. A, the stock, cut to receive the graft; A1, the position of the tongue. B and C, grafts ready for applying to stocks; B1, the stock bud; B2, the long, oblique cut surface; C1, the position of the tongue. D, graft and stock fitted together. E, graft and stock bound together with rafia; E1, the stock-bud which is left uncovered. F, the operation completed, all the cut surfaces covered with grafting wax.

CLEFT GRAFTING.

This method is commonly practised for large stocks or trees that have been headed back and whose branches are too thick for Tongue or Splice Grafting. A cut is made with a saw at a right angle through the limb and about a foot or so from where the limb branches out from the main stem, care being taken not to loosen or tear the bark from any part of the stub. The exposed end is then smoothed over with a sharp knife to facilitate healing, and then split with a broad, thin chisel or with a grafting tool such as shown in Figure 2. The Cleft is held apart as in Figure 2A, or a wedge is inserted to allow the scions to be pushed carefully into position, taking care that the inner bark of the scion fits that of the stock. The wedge is then withdrawn and the scions tied in position with raffia. The scion should contain 2 to 3 buds and is prepared by sloping the lower portion in the form of a wedge about 1½in. long, one edge of the wedge being thicker than the other and set in the stock with the thicker edge of the wedge to the outside. This will hold the scion firmly in place and the greatest pressure will come at the outer edges where growth takes place.

In order to be sure that the growing tissues come in contact, the scion is sometimes set at a slight angle so that the growing wood of the scion must cross that of the stock at some point.

As a rule two scions are set in each limb, one at each edge of the Cleft as shown in Figure 2c.



[*From Bltn. No. 2, Brit. Min. of Agric.*

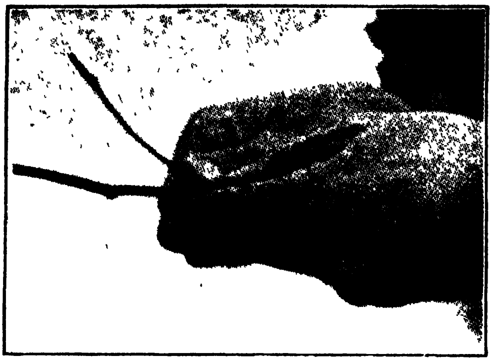
Fig. 5.—Whip Grafting.—Stock larger than graft. A, the graft ready prepared; A1, the position of the tongue. B, the stock cut to receive the graft; B1, the square cut; B2, the longue oblique cut; B3, the tongue. C, graft applied to the stock, the tongues fitted together.

If both scions grow, the less desirable one may be removed. To complete the operation, all cut surfaces are covered with grafting wax from the lowest point of the Cleft section upwards. At one time a mixture of clay, straw and cow manure was used to seal up the grafts, but other mastics are now available which are less liable to crack or be washed off, and less bulky to carry about and more easily manipulated.

Cleft Grafting is not to be recommended, because the split in the branch of the stock, besides weakening it, serves as a harbour for insects, and makes it improbable that the wound will ever properly heal over.

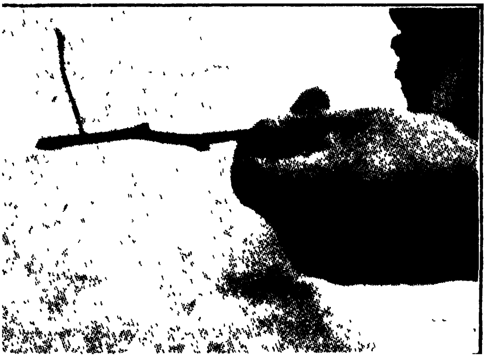
BARK GRAFTING.

This method of grafting does not injure the stock to the same extent as Cleft Grafting, a better union is generally made, more scions can be placed around a large stock, the operation is more quickly performed and with more chance of success. Until recent years it was the common method employed for reworking fruit trees by most Australian fruitgrowers. It is known in England and France as Crown Grafting.



[*From Bltn.* 63, *Vic. Dept. of Agriculture.*

Fig. 6.—Cutting the "strap" in scion ready for strap graft. Note the bud near the end of the strap (the portion raised). It is wise to have a bud so placed.



[*From Bltn.* 63, *Vic. Dept. of Agriculture.*

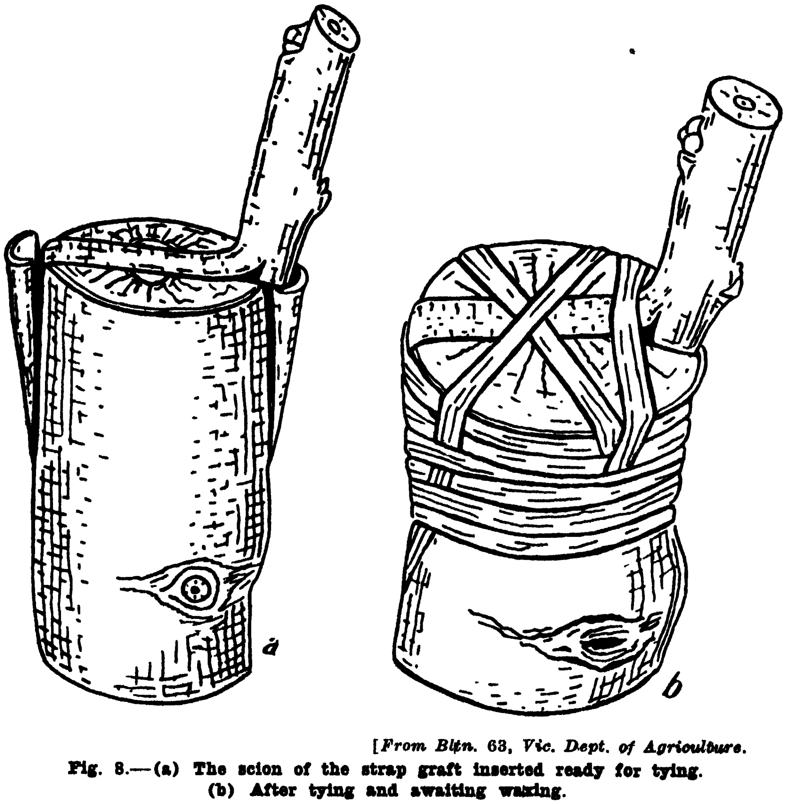
Fig. 7.—The scion for a strap graft prepared ready for grafting.

Several different methods may be employed but the principle is much the same in each case, the scion being placed between the bark and the wood tissue of the limb. It can best be done when the bark of the stock lifts readily from the wood, that is, when the sap is in active movement.

The initial treatment of the tree is the same as in Cleft Grafting, but instead of splitting the branch, a vertical incision 1 to 1½in. in length is made in the bark. The bark is then gently eased away on either side at the top of this cut.

A scion containing 2 or 3 buds is prepared by making a long, slanting, plain surface cut at the lower end and slightly longer than the incision on the branch. A wedge point is made by cutting away a small portion of the lower extremity on the bark side so that the bark at the base of the scion will not be bruised or crumpled back when the scion is gently pushed into position between the bark and wood tissue of the severed limb. The wedge point will facilitate the operation and help to ensure the success of the graft. The scion should be pressed downwards until the upper edge of the cut surface is almost level with but not below the top of the branch (Figure 3c).

A stock bud is sometimes left on the reduced portion of the scion as shown in Figure 3c. This bud generally remains dormant but should the top of the scion be broken away by accident, it will burst into growth, thus repairing the damage.



[*From Bltn. 63, Vic. Dept. of Agriculture.*

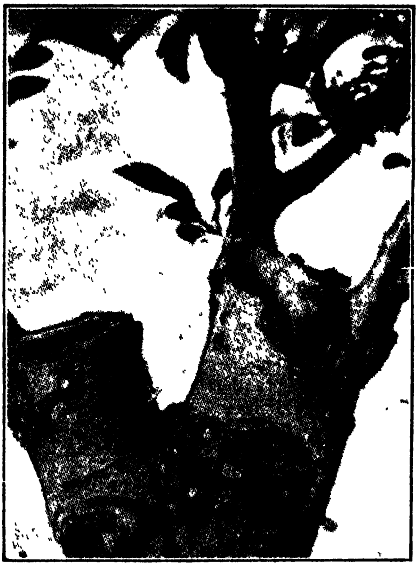
Fig. 8.—(a) The scion of the strap graft inserted ready for tying.
(b) After tying and awaiting waxing.

The graft is then tightly bound in with raffia, care being taken to see that the top tie is as tight as possible. This is rather important, for a perfect union at this point is necessary to prevent the graft being blown out by the wind or broken out when carrying a crop of fruit. It is now common practice to secure the scions to the stock with ½in. to ⅝in. x 20 G. brads. If one scion only is being used it is better placed on the top side of the stub, the cut is then more protected from the weather and the graft is less liable to break away.

A variation in Bark Grafting when smaller limbs are being treated and only one scion inserted, is to make the cuts in the branches obliquely instead of at right-angles, by which means they are better protected from the weather. A small tongue may be left on the inner side of the scion which is placed at the top and made to fit accurately on the sloping face of the stock, thus bringing a larger space in contact, with a better chance of strong union.

WHIP OR TONGUE GRAFTING.

This method is almost invariably used for Root Grafting and nursery work when stock and scion are approximately of the same diameter. In making a Whip Graft, one long, smooth, slanting cut is made at the top of the stock with a sharp knife. The knife is then placed on the cut surface near the top and the stock is split in the direction of its longest axis, forming a tongue. The same form of split is made in the cut face of the scion to form a tongue or wedge to fit into the opening made in the stock, thus locking stock and scion together. Some difference in diameter of stock and scion may be disregarded, but it is necessary in order to effect a union, that the edge of the stock and scion must be even on one side. As with other forms of grafting, stock and scion, if worked above ground, must be tightly bound with raffia and the cut surfaces waxed over to keep them air tight. Root Grafts are bound but not waxed. Figures 4 and 5 illustrate working methods.



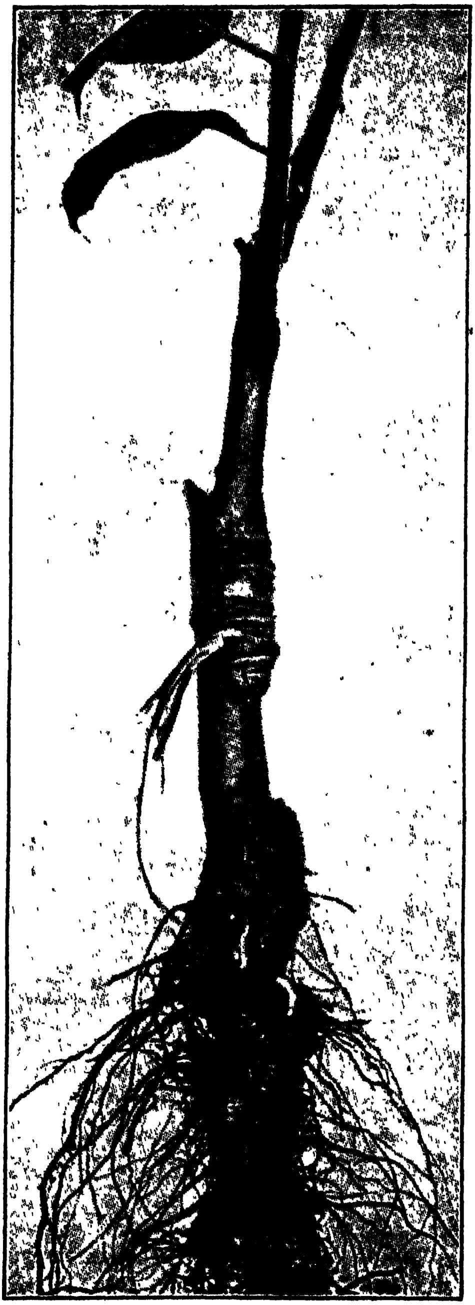
[*From Bltn. 63, Vic. Dept. of Agriculture.*

Fig. 9.—A Close-Up View of Grafts—Two-year-old Scions. The "strap" will quickly cover the whole of the cut surface.

STRAP GRAFTING.

This is really an improved type of Bark Grafting so named from the strap of bark used in fixing in the scion. The chief advantage is that a much speedier callus is formed than with other methods of grafting, thus preventing decay of the stock, and giving greater stability to the limb. A little more time is occupied in the operation, but with practice, the operator can quickly become expert. It is best adapted for limbs up to 1½in. in diameter, but may be used on larger stubs.

The stock is prepared in the same manner as for Bark Grafting but the scion, however, is treated differently. It is so cut that a long strip of bark with a thin piece of wood attached remains on the back of the scion, extending from the upper point of the sloping cut usually made in the preparation of a bark graft. After



[*From Bltn. No. 2, Brit. Min. of Agric.*

Fig. 10.—A Graft seared by raffia.

the scion has been pressed into position this strap of bark is stretched across the cut surface of the limb, the end is turned down an inch or so and inserted between the wood and the bark, on the opposite side to the scion and in the same manner. The strap should be securely fastened down, as it must rest firmly on the cut, otherwise it is likely to curl up and will not take. The whole is then securely tied and all exposed cut surfaces waxed over to exclude air. Figures 6 and 7 illustrate the preparation of the scion for Strap Grafting, and Figure 8A the method of inserting scion, and Figure B tying up.

Fig. 11.—Pear tree, crown grafted, mounded over with soil.

In the illustration, two vertical incisions have been made in the bark, the distance between the cuts corresponding with the width of the scion. This method is sometimes used instead of the single cut previously described. Figure 9 shows Strap Grafts 2 years old.

GRAFTING WAX.

The object of using a mastic or Grafting Wax is to exclude air and all foreign substances from the points of union, and to prevent the drying up of the sap at this point. There are several recipes for making Grafting Wax, the ingredients generally being beeswax, resin and tallow in varying proportions. A good wax is made by mixing the following ingredients:—4lbs. resin, 2lbs. beeswax and 1lb. tallow or linseed oil. If it is desired to have the wax of a greater hardness than will result from this formula, the resin may be increased to 5lbs. and the beeswax to 2½lbs. The resin and beeswax are melted with the tallow or in the linseed oil, and when thoroughly hot, the mixture should be poured into cold water and when cool enough to handle should be pulled and worked until it is light coloured and grained.

In applying the wax the heat of the hand is sufficient to soften it; it may also be melted and applied hot with a brush, if care is taken not to make it sufficiently hot to cause injury to the bark.

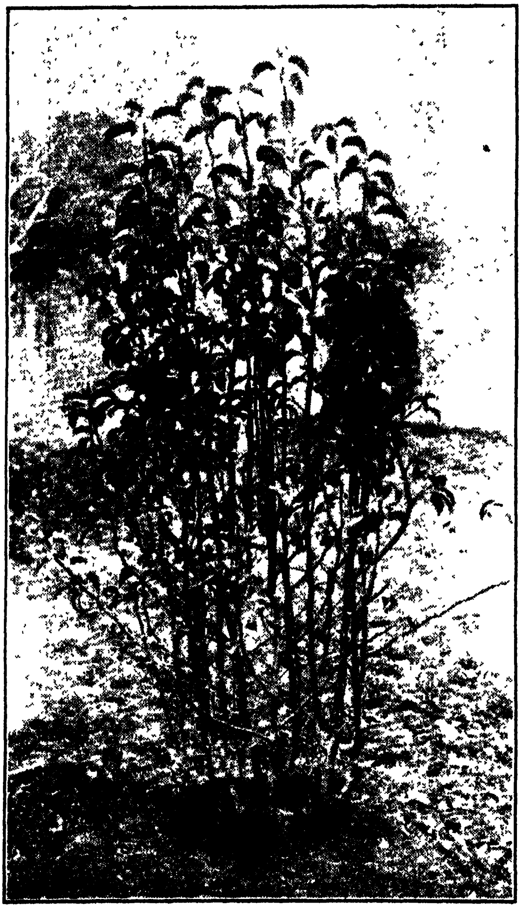


Fig. 12.—Large Glou Morceau pear in late G. R. Laffer's Orchard, worked over to Parkham's Triumph. Stock, 16in. diameter, on which 14 bark grafts have been inserted. Growth, 1-year-old.

If wax bands are prefered these can be made by dipping wide strips of calico into the boiling mixture and when thoroughly soaked, drawing them through two pieces of wood to remove surplus wax which collects in irregular lumps on the calico. When cold, the calico can be torn into strips of any desired width, and these strips, for convenience in handling, can be wound round a stick in the form of a ball. The sticky nature of wax made from this recipe is its great disadvantage.

it is very difficult to keep the hands and grafting implements clean and the work of the operator is more or less impeded. In modern mastics this difficulty has been overcome and combinations of paraffin wax and crude petroleum jelly have taken the place of grafting wax.

There are also prepartions on the market which after a time rot away the raffia bands, thus saving time in the removal of the bands and preventing the searing of bark through neglecting to do so as in Figure 10. Wax or waxed bands should be used only on cut surfaces and while sufficient should be applied to exclude the air thoroughly, it is not wise to use overmuch. The heat of the sun may cause it to run, with probable damage to adjoining bark.

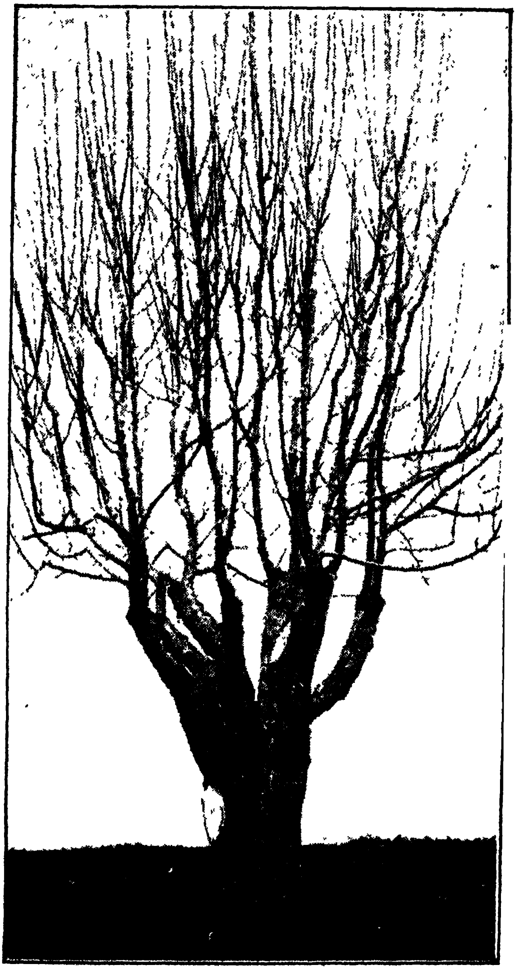


Fig. 13.—Pear tree, bark grafted on main limbs, 3 years old, producing small quantity of fruit this season.

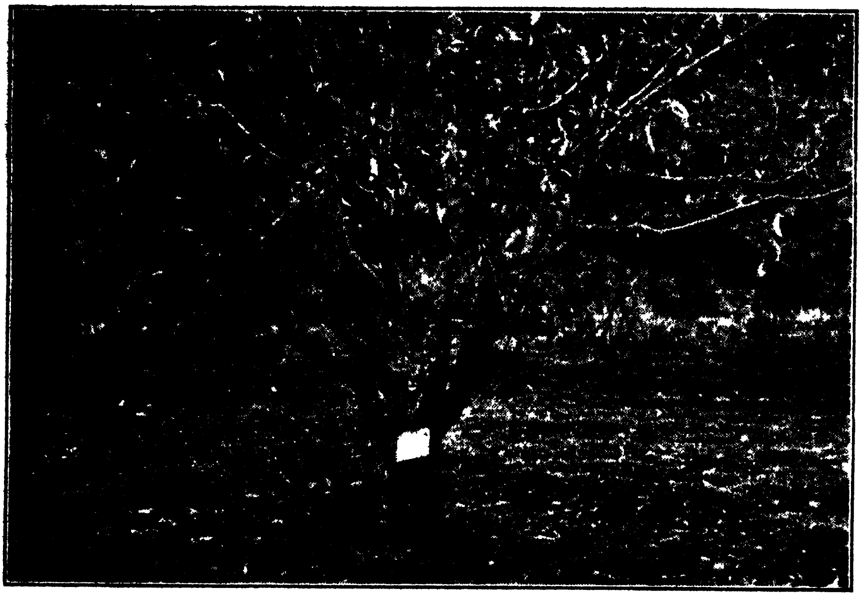


Fig. 14.—Shockley, reworked to Granny Smith in 1926, with bark grafts, showing typical growth.

Fig. 15.—View of Pear Tree in late G. R. Laffer's Orchard, crown grafted with bark grafts, showing fusion of scions and the healing over of stock. Hundreds of pear trees in this orchard are worked over in this way.

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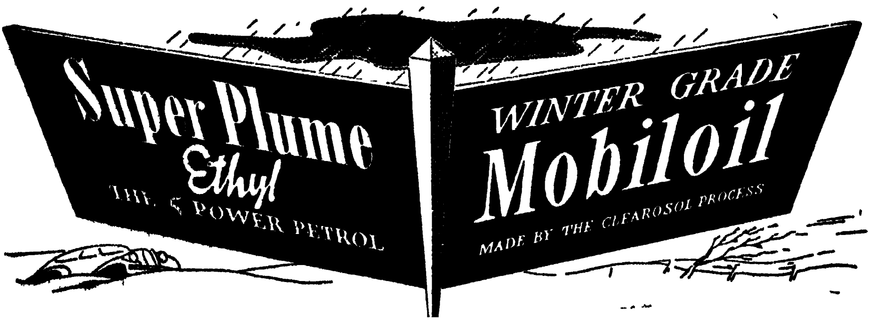

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PREPARATION OF THE TREE.

The tree to be grafted can be cut down any time during the dormant period or even at the time the operation is to be performed. It is, however, better to remove the head during pruning operations, leaving longer arms than are necessary. These can then be shortened back to the desired length at the time of grafting.

Crown Grafting, cutting back to the main trunk just above ground level (Fig. 12) was once recommended, and though pears may succeed very well when grafted in this manner, it has proved unsuitable for apples. Fig. 12 is a view of a large pear tree, 16in. in diameter, in which 14 bark grafts have been inserted. Figs. 11 and 15 also show pear trees worked over in the same way, in different stages of development.

AFTER TREATMENT OF GRAFTS.

Care and attention is necessary after grafting has been done or much good work may be spoilt and time lost. Ties should be carefully examined at intervals of a fortnight or so, and removed before starting to cut into the bark. A fresh coating of wax should be applied to cut surfaces for several years. If more grafts have taken than are required, one or more can be removed. All shoots developing below the union should be removed as soon as noticed. When the grafts begin to grow vigorously, they should be supported by stakes driven in round the stock, to which the grafts can be securely tied. If not supported in this way they should be severely summer pruned to minimise the risk of having them blown out by the wind.

(*To be continued.*)

CHIEF AGRICULTURAL INSTRUCTOR.

APPOINTMENT OF MR. R. C. SCOTT, R.D.A.

Upon the promotion of Mr. W. J. Spafford to the office of Director of Agriculture, Mr. R. C. Scott, R.D.A., who has occupied the position of Supervisor of Experimental Work since 1927, has been appointed Chief Agricultural Instructor.

Mr. Scott is a graduate of Roseworthy Agricultural College, having gained the College Diploma (with honours), and with credit in Agriculture, in 1913. After a year's farming experience in the Booborowie district he was appointed Farm Assistant at the College and in July, 1914, he succeeded Mr. Spafford as Assistant Experimentalist. Subsequently, he held various appointments at the college besides that involving experimental work—Demonstrator in Agriculture, Assistant Lecturer in Agriculture, and he was constantly in collaboration with the Principal in the preparation and publication of the reports of that Institution. Besides the control of the important experimental work with fertilisers, rotation of crops and systems of tillage, Mr. Scott was successful in the selection and breeding of wheats. He was associated with selecting and fixing the type of the varieties Sultan and Felix. Besides others he raised Sword and Dan, both of which have become very prominent in recent years.

During the absence of the Principal from May, 1927 until July, 1927, Mr. Scott had charge of the College farm, and agricultural instruction to students.

In 1927 he was transferred to the Department of Agriculture in Adelaide to take a new position—Supervisor of Experimental work. In this office he has had control of the agricultural experiments carried out by the Department, including those conducted in co-operation with private farmers. He also had charge of the work at the Minnipa, Veitch and Booborowie Experimental Farms until they were closed, and during the past four years he supervised the operations of the Turretfield Seed Wheat Farm.

The experimental work of the Department covers all branches of agriculture, including cereals, pasture, fertilisers, tobacco, livestock, noxious weeds, insect pests, etc. The centres where they are conducted approximate 200 in number and are scattered generally from one end of the State to the other. In controlling this work, Mr. Scott has become thoroughly acquainted with the agriculture of South Australia and has a clear understanding of the varying conditions of soil, climate, rainfall, &c. under which agriculturists are working. He was further closely connected with measures taken to deal with the grasshopper infestation of 1934 and 1935, together with the organised effort which was successful in controlling the pest on the irrigated area of the River Murray.

When the Deputy Director of Agriculture was absent from the State for a period of six months on a tour of the Southern Hemisphere, Mr. Scott was called upon to undertake duties similar to those of the office to which he has just been appointed and attended all conferences of the Agricultural Bureau.

MR. R. C. SCOTT, R.D.A.

Early this year he was chosen by the Government to accompany the party of South Australian farmers which toured New Zealand, and thus had the opportunity of studying the agriculture of that country and gaining information of value to the State.

Besides reports dealing with the results of experimental work, Mr. Scott has written several articles for the pages of this Journal, which have been published in bulletin form. Principal among these are "Wheat Varieties," "Production of Fat Lambs," "Fat Lamb Production Investigation" (written in conjunction with Mr. W. J. Colebatch), "Pasture Improvement" (in conjunction with Mr. E. M. Hutton), and "Tobacco Culture" (in conjunction with Mr. S. P. Opie). His report on the visit to New Zealand is now being published and is being read with interest especially by those associated with the sheep and dairying industries.

Mr. Scott is an accomplished platform speaker and with his informative knowledge of a wide range of agricultural subjects he will always be a welcome visitor at Bureau conferences and Branch meetings.

IMPORTANT WEEDS OF SOUTH AUSTRALIA.

[By G. H. Clarke, B.Sc., Botanist, Waite Agricultural Research Institute,
University of Adelaide.]

Nos. 19 and 20.—BROAD-LEAVED AND NARROW-LEAVED COTTON BUSHES.

Asclepias rotundifolia, Mill. *Asclepias fruticosa,* L.

The plants described in the following paragraphs are introduced weeds, and though termed "Cotton-bushes," have no connection or resemblance with the native plants known by that name. The true Australian Cotton-bush is a dry country species of *Kochia,* which, like many of its allies the Salt-bushes, is esteemed as a native fodder plant of considerable value in parts of the arid interior. It derives its name from the occasional presence, especially during periods of protracted drought, of cottony galls which are supposed to be caused by some species of insect.

The names "Cotton bush" and "Wild Cotton" are also applied, however, to species of the African and American genus *Asclepias,* the *follicles* or pod-like fruits of which, like the *bolls* or capsules of the true Cotton Plant, contain very numerous seeds giving attachment to cotton-like hairs. Such hairs, in the case of certain cultivated species of the Malvaceous genus *Gossypium,* constitute the cotton of commerce; those of *Asclepias,* however, are of no commercial value: indeed, they are of silky rather than of cottony consistency, and, on this account, species of *Asclepias,* in America, are sometimes spoken of as "Silk-weeds." The more general name in that country is, however, "Milk-weed," on account of the copious milky sap which exudes from the plants when the surface is injured.

Of the two species to be described one has an almost world-wide reputation as a weed. Native originally to South Africa it is now established on the shores of most tropical countries of the world. This species, *Asclepias fruticosa,* L., occurs throughout temperate Australia where it is perhaps better known by its synonym, *Gomphocarpus fruticosus* (L.) R.Br. It is one of the few introduced weeds that appears to be able to compete successfully, in places, with the native sclerophyll vegetation which clothes so much of the eastern coastline of Australia; and, in the mistaken belief that it is a native species, the plant has sometimes been referred to, erroneously, as the "Native Cotton."

This species, now known in South Australia as the "Narrow-leaved Cotton-bush," has been the subject of much confusion in the past. It is not of very common occurrence in this State; indeed, so far from being regarded as a weed it is not infrequently cultivated as a garden plant; whereas it is recognised as a weed in parts of New South Wales and Victoria. On the other hand the "Broad-leaved Cotton-bush," *Asclepias rotundifolia,* Mill., which is relatively less common in the eastern States, does grow very vigorously under South Australian conditions, and is extremely common as a weed in the hills and foothills near Adelaide. This broad-leaved plant appears to have been mistaken, at first, for the narrow-leaved species. *Gomphocarpus fruticosus* was listed early as a noxious weed, though the plant aimed at was, evidently, *Asclepias rotundifolia,* or, as it was then called, *Gomphocarpus aborescens* (L.) R.Br. This gave rise to a state of affairs similar to that which had previously existed with respect to the Star and Saffron Thistles, and, as in the case of these thistles, the inevitable result has been to place both species upon the later list of weeds proclaimed noxious for South Australia.

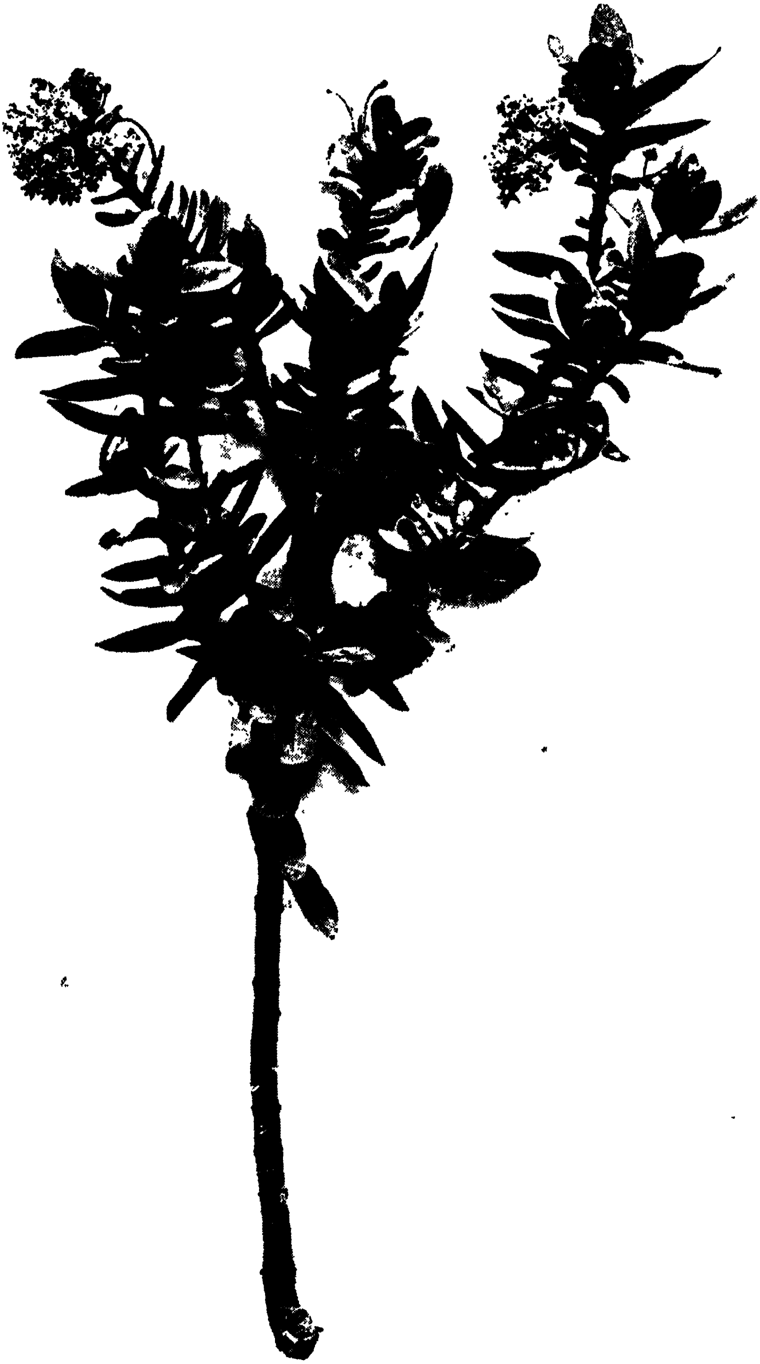


Figure 1.—Broad-leaved Cotton-bush (see coloured plate opposite).

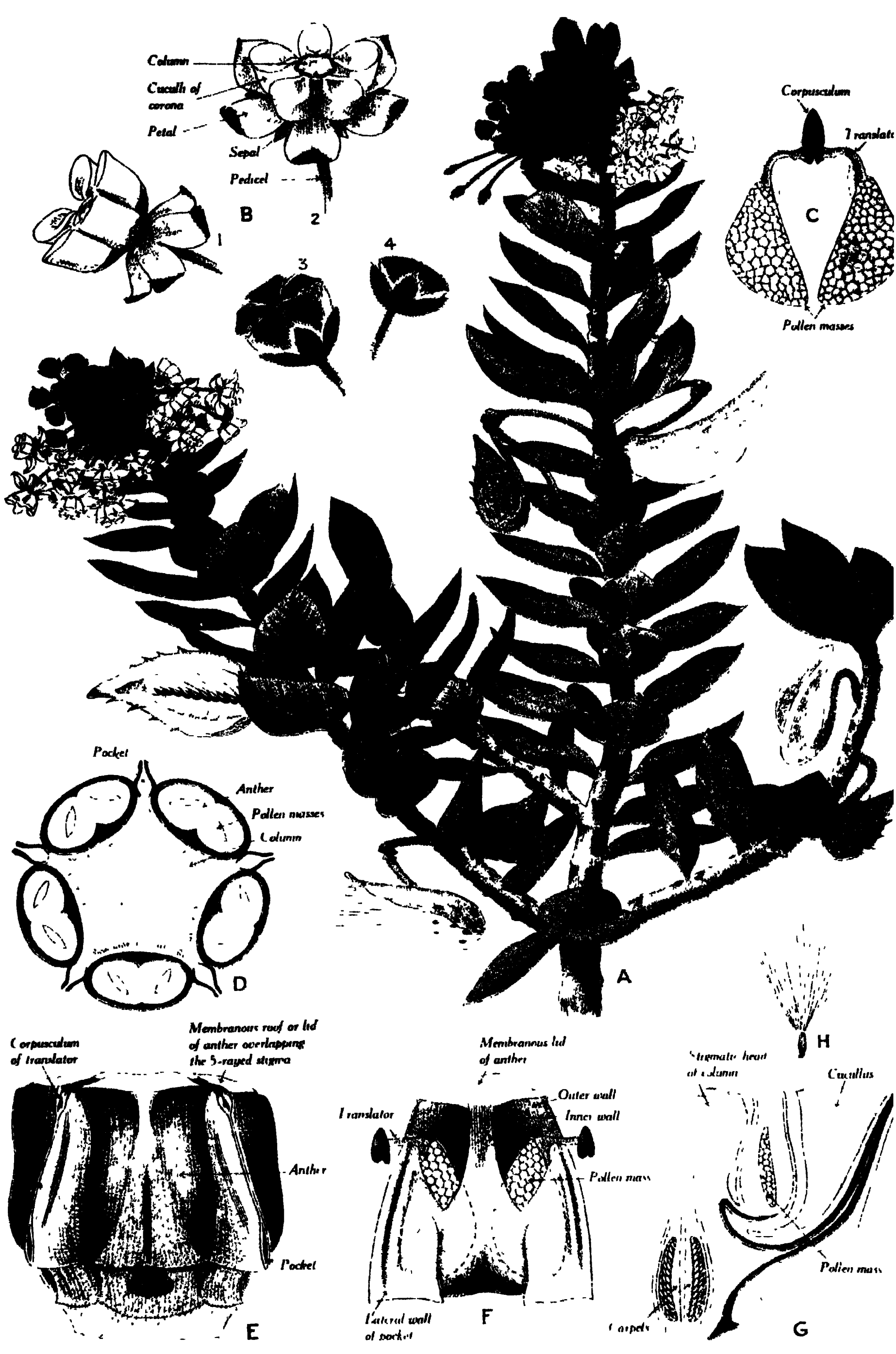


PLATE I. THE BROAD-LEAVED COTTON-BUSH (*Asclepias rotundifolia*, Mill.)

A.—Portion of leafy shoot showing buds, flowers, and fruits (about ½ natural size.) Bl., B2., B3., B4.—Buds and flowers (enlarged.) C.—Translator and pollen masses. D.—Column in transverse section showing the appressed anthers. E.—Column viewed from the side after removal of the corona, showing abaxial surface of anther and interstaminal pockets. F.—Adaxial surface of anther showing position of translators and pollen masses. G.—Portion of vertical section through flower showing relationship of anther and corona lobe (*cucullus*) to the

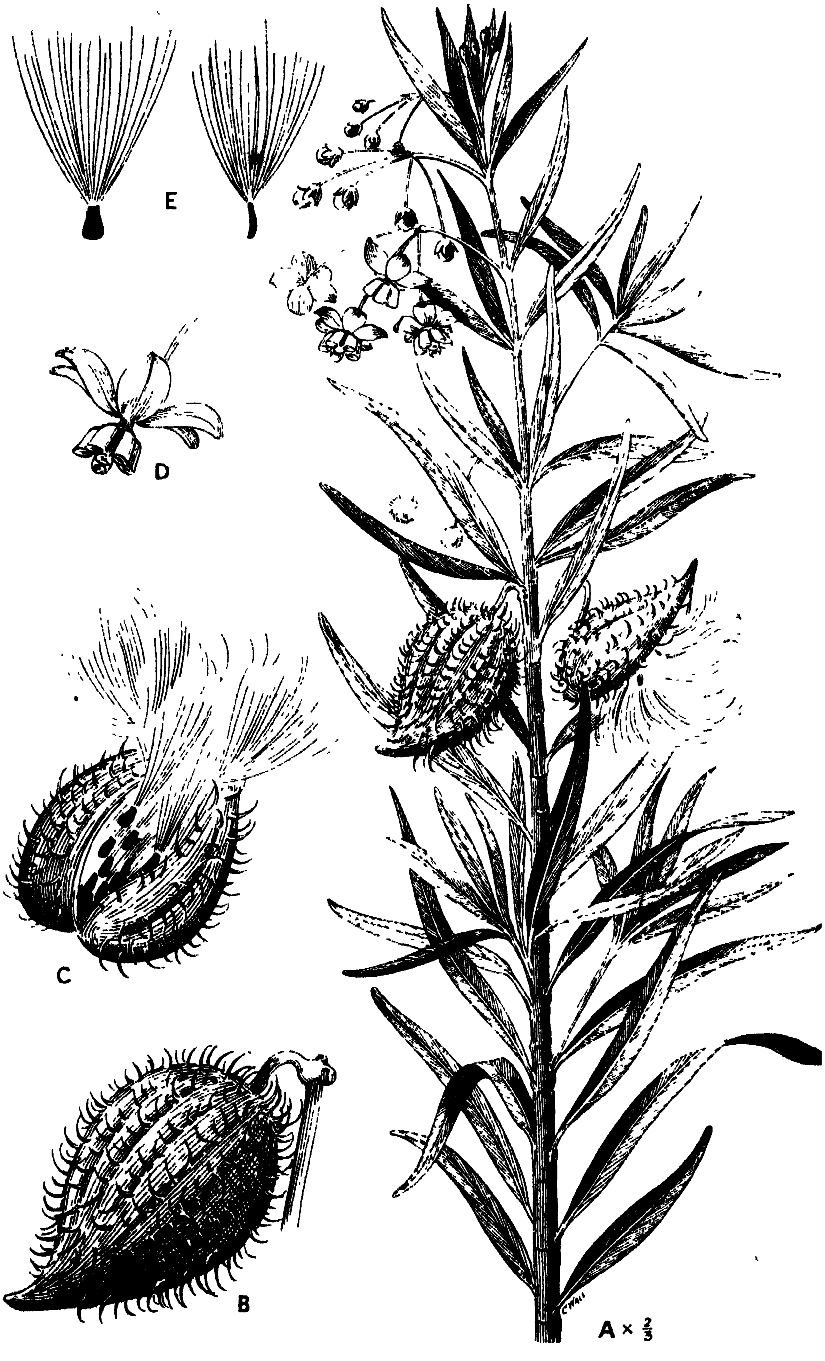


PLATE II. NARROW-LEAVED COTTON-BUSH (*Asclepias fruticosa*, *L.*)

A.—Branch with flowers and fruits. B.—Ripe fruit. C.—Fruit in process of dehiscence. D.—Flower. E.—Seeds.

Differences Between the Two Cotton-Bushes.

As their names imply, the two species differ markedly from each other in leaf form. In *Asclepias rotundifolia* the leaves are broad and oblong, one or two inches long, and of tough leathery consistency; whereas, in *Asclepias fruticosa,* they are narrow-lanceolate, from one to three inches long, and of thinner texture, as well as being of a paler, more yellowish, green colour. In both species they are usually opposite and very shortly stalked, but their more horizontal disposition in the broad-leaved plant makes the first-named character more noticeable, especially in the case of old leafy stems, on which each pair of leaves is separated by a conspicuous internode (Figure 2). In older plants of both species the lower parts of the stems are bare, and are marked by the scars of the fallen leaves (Figures 3 and 4). The stems of *A rotundifolia* are hairy and stouter than those of *A. fruticosa.* In addition, the flower buds, undersides of the petals and sepals, and often the young stems and foliage leaves, as well as being clothed with hairs, are of a reddish-purple colour in the former species. Differences are to be observed also in the shape and covering of the fruits, and in certain minor details of floral structure.

Botanical Name and Classification.

The name *Asclepias* (from the Greek *Asklepios,* 'The God of Medicine') was given by the ancients to a plant of this family on account of its supposed efficacy as an antidote of certain poisons; *rotundifolia* (from Latin *rotundus,* 'round' and *folium,* 'a leaf' means 'round-leaved'; *fruticosa,* literally 'fruticose' or 'shrubby' (Latin *frutex,* 'a shrub') fails to discriminate between the two species.

Asclepias with its approximately 250 species, of which about 100 were formerly separated under *Gomphocarpus,* is the largest genus of the family to which it gives its name, viz., the *Asclepiadaceae.* The account given below of the floral structure and pollination mechanism of the two species under consideration will serve to indicate the type of specialisation that is met with in this family. With regard to the family as a whole it will suffice to point out that it is mainly tropical in its distribution, being especially well represented in Africa; that, of the 1,700 or so species comprised within about 320 genera, the majority, unlike the two Cotton-bushes, are lianes or woody climbers; that a large number of them are poisonous; and that the presence of a milky sap or latex is very general; also that, while there are no native species of *Asclepias* in this country, the family is represented in Australia by 14 genera and some 53 species of native plants.

In addition to *A. rotundifolia* and *A. fruticosa* a third species, very similar to the latter, namely, *A. physocarpa,* Schlechtr., occurs in the South-East of this state. All three were formerly placed under *Gomphocarpus* on account of the absence from the floral nectaries of a curved horn present in other species. A fourth one, *Asclepias curassavica,* L., in which this character is present, occurs as a weed in Queensland, and, as early as 1868, enjoyed a wide distribution in that State. The same plant has been grown for medical purposes in South Australia. It is easily distinguishable from the other three Cotton-bushes, apart from the character referred to by its orange-red flowers and elongated seed pods.

Botanical Descriptions.

In the *Flora of South Australia* (page 464) the two Cotton-bushes are described by Mr. J. M. Black as follows:—

(1) *A. rotundifolia,* Mill. Shrub about 1 m. high with stout pubescent spreading stems; leaves ovate-oblong, coriaceous, 2½-5 cm. long, with very oblique lateral nerves; umbels 10-20 flowered; corolla white inside, pubescent and purplish outside; outer edge of corona-lobes higher than the inner; follicle ovoid-acuminate, about 5 cm. long, pubescent and with a few soft pines. *In flower*: April to August.

(2) *A. fruticosa,* L. Slender erect shrub, 1-2 m. high, the branches white-pubescent; leaves linear-lanceolate, 5-10 cm. long; umbels loose, 3-10 flowered; corolla-lobes white, ciliate; corona-lobes compressed, the outer edge lower than the inner, which terminates in 2 incurved teeth; follicles as in the preceding, but covered with numerous soft spines. *In flower*: November to February.

FLORAL STRUCTURE AND POLLINATION MECHANISM.

The flowers of both Cotton-bushes are borne in drooping clusters or *umbels* on peduncles which are both terminal and lateral in position. The lateral peduncles arise from the stem at a point on the node midway between the pair of opposite leaves, instead of from the leaf-axils as is more usual in plants. Such an origin is explained by assuming, either that the true point of origin is the node below and that part of the peduncle is fused with the intervening internode, as is believed to occur in the case of may *Solanaceae,* or that the peduncle really terminates the stem, the *apparent* continuation of which is actually a lateral branch, in short, that the stem is a *sympodium.* Which of these two interpretations is correct it is impossible to say.

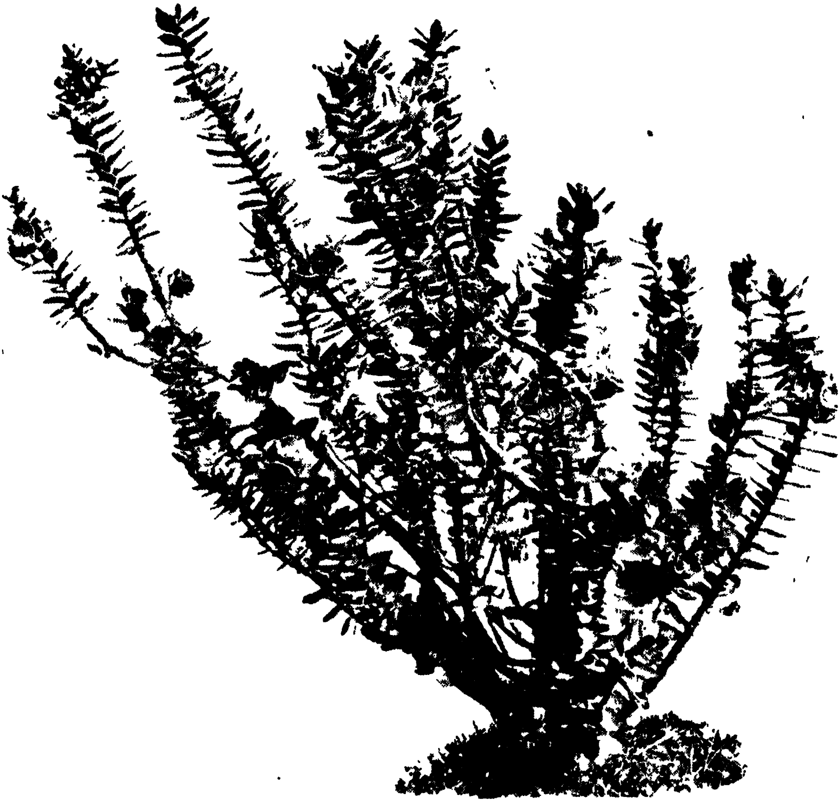
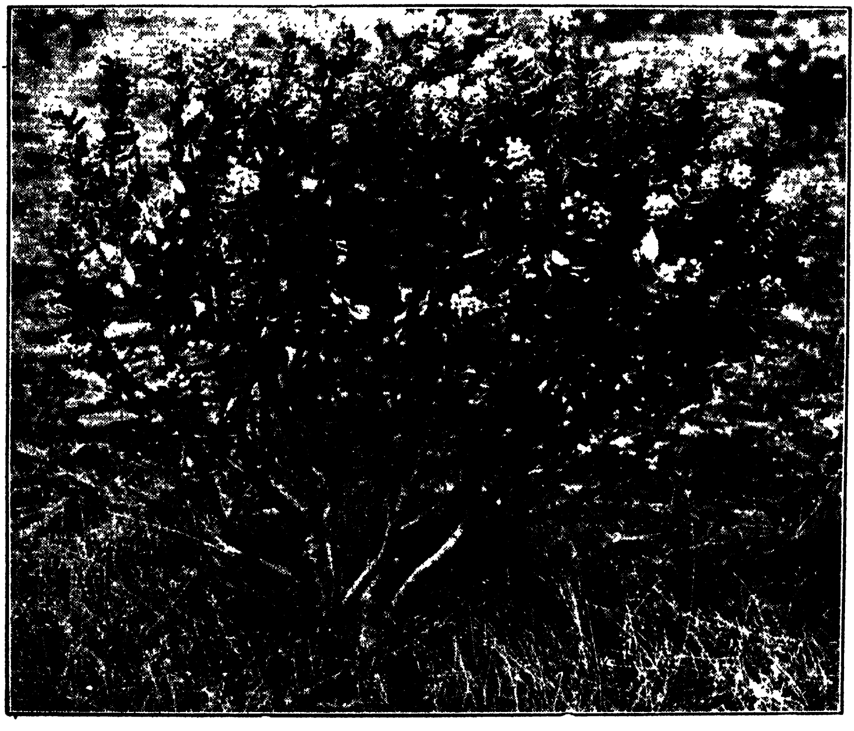


Figure 2.—Broad-leaved Cotton-bush. Single plant, showing mode of branching and arrangement of leaves on the stems.

The construction of the flowers themselves, though characteristic of the Asclepiad family, is of a type most unusual among flowering plants. The essential organs, namely the stamens and pistil or carpels, are obscured by the presence of a *corona,* consisting of a series of pitcher-shaped nectaries termed *cuculli,* attached one to the back of each of the five stamens. They are further obscured by the union of the filaments of the stamens to form a structure, the *gynostegium* or column, which, in its lower part, surrounds and encloses the carpels, and, in its upper part is united with their extremities to form a terminal five-rayed stigmatic disc. With these modifications, however, the flower conforms to a simple structure plan and, except for the carpels, is radially symmetrical. The floral axis bears four whorls of parts, one each of calyx, corolla, stamens, and carpels. The number of segments comprising the whorl is five in every case, except that of the carpels in which the number is reduced to two.

The calyx is represented by five linear-lanceolate sepals which are relatively small in size and, unlike those of most flowering plants, do not enclose the flower in the bud stage. This function is performed by the corolla, the five petals comprising which subsequently separate and become strongly reflexed in the open flower. The petals remain united at the base, though their free parts are much longer than the tubular basal portion of the corolla, which is obscured somewhat by the column of stamens to which it gives o[illegible] The column is mainly composed of the united filaments of the five stamens [illegible] represents the third whorl of parts. Towards its middle it gives attachment to the corona, and slightly above this to the five anthers, while, at the summit, it becomes continuous with the stigmatic disc. The uppermost whorl consists of the two carpels. These structures are quite free from each other below and they occupy a cavity in the interior of the column; but their styles become united towards their tips and expand to form the stigmatic crown with which the staminal column is fused.



[*Photo by A. D. Cocks.*]

Figure 3.—Broad-leaved Cotton-bush. Older plant in flower, photographed in the field, showing the habit of growth.

The detailed structure of the stamens and carpels is indicated by the figures labelled B, D, E, F, and G, on the accompanying coloured plate. The essential parts of the stamens, namely the five anthers, are closely applied to the sides of the stigmatic disc in the hollows between its rays. The top of each anther is covered by a white membranous roof which overlaps the margin of the disc in this situation. The lateral walls of the anthers are purple in colour and enclose two pollen sacs or anther cells. The pollen, unlike that of most plants, is not in the form of separate grains, but resembles that of Orchids in that the individual grains are united together to form *pollinia*, or pollen masses, one such pollinium occupying each anther cell. Thus an anther, at maturity, contains two pollinia, and an elaborate mechanism has been evolved to ensure the transference, by insects, of these pollen masses from flower to flower. The presence of a column or gynostegium, the production of pollinia, and the transference of the latter by insect life, are all points of resemblance between the flowers of Cotton-bushes and those of Orchids. These resemblances are of importance, and it is worthy of note that both Asclepiads and Orchids are characterised by the development of a many-seeded type of fruit.

The inner part of the wall of each anther cell, t[illegible], the region in contact with the side of the stigmatic disc, is incomplete in its upper part, an opening being left through which the contained pollen mass is drawn when mature. Through this opening passes a structure, the *translator*, with the aid of which the pollen masses are withdrawn from the anther cells during pollination. The exact shape and appearance of the translator is shown by Figure C of the coloured plate; it consists essentially of a thread, or pair of threads (*retinaculae*), connecting the pollinium of one anther cell with the corresponding structure occupying the adjacent cell of the next anther. The middle part of this thread, or the point of junction of the two threads, is thickened to form a small body, the *corpusculum*, shaped like a narrow shield, and this is insecurely fixed to an adhesive disc situated on the column at a point midway between the two anthers and in close relation to the receptive surface of the stigma. The corpusculum occupies the uppermost recess of one of a series of small pockets situated between contiguous anthers, and appearing on the surface of the column as verticle slits bordered by tough membranes. These membranes are continuous, both with the walls of the anthers, and with the sides of the stigmatic disc in the region of its rays. The slit-like openings face upwards as well as outwards, the subjacent pockets becoming shallower towards the upper part of the column.

In the undissected flower the anthers, and the slits between them, are hidden from view by their large appendages or *cuculli*, which collectively form the *corona*, of the flower and whose relationship to the corresponding stamens is well shown in vertical section through the flower (Figure G). These structures, each of which is shaped somewhat like an inverted canine tooth, are concerned in nectar production. The presence of a curved horn in certain other species of *Asclepias* has already been referred to.

Insects are attracted to the flowers in search of nectar. In crawling over the column an insect may insert its leg into one of the slits between adjacent anthers and make contact with the translator. Should this happen the corpusculum is readily detached and the slightest traction is sufficient to draw the pollen masses from their respective anther cells. The translator threads, with their attached pollen masses, contract in such a way as to firmly clasp the insect's leg, with the result that when it leaves the flower the two pollen masses are carried with it. Alighting upon another flower the same insect may deposit the pollen masses in a position corresponding to the one from which it removed them in the previous flower so that they are brought into contact with the stigmatic undersurface of the disc.

The biological advantage of this type of pollination mechanism is worthy of consideration, since it helps to explain the efficiency and importance of the Cotton-bushes as weeds. The outstanding character of these plants is the production of large quantities of viable seeds. This character, combined with (*a*) a perennial habit, (*b*) an ability to thrive in situations of low soil fertility, and (*c*) the presence of an acrid and poisonous milky sap which renders them immune from being grazed down by stock, makes the Cotton-bushes formidable as weeds in certain situations, such as gullies and hillsides subject to being periodically ravaged by bush fires. The large amounts of seed produced, the ease with which it is dispersed by both wind and flood, and the readiness with which it germinates, gives these plants an immense advantage in competition with the native vegetation seeking to rehabilitate itself after extensive destruction by fire.

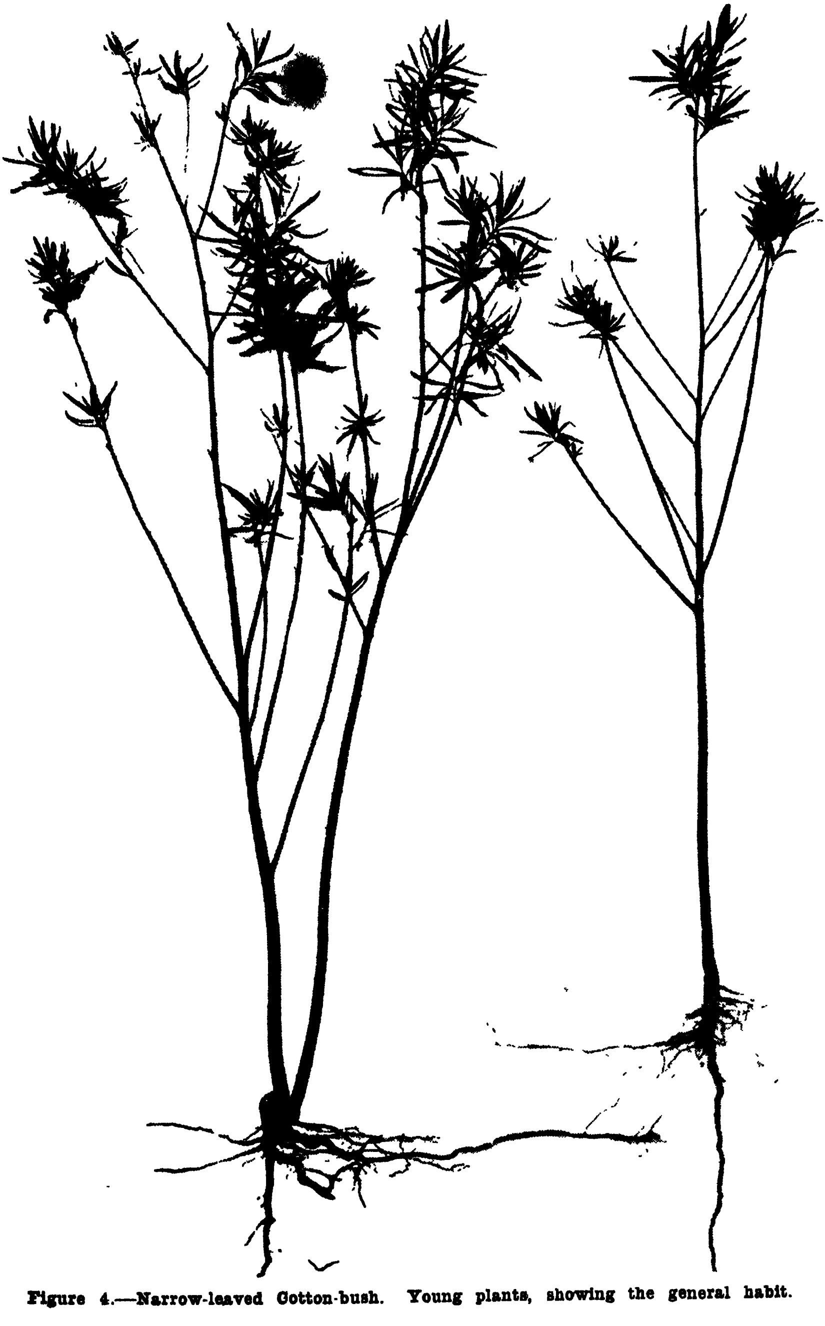


Figure 4.—Narrow-leaved Cotton-bush. Young plants, showing the general habit.

The transference of pollen in the form of masses or pollinia is related to the production of fruits containing many seeds; it ensures the fertilisation of a large number of ovules by one single act of pollination. Where the pollen is in the form of isolated grains a number of separated acts of transference may be required to bring about the fertilisation of the full number of ovules present in the ovary, since, normally, one pollen grain is needed fo[illegible]e fertilisation of each ovule. Hence if insufficient pollen reaches the stigma of [illegible]ower, only a proportion of the ovules can receive fertilisation, and the remainder will fail to develop into seeds. That this frequently happens is a matter of common experience. In garden peas, for example, the number of seeds present in the pod is subject to great variation even in the one plant. Some may have four or five, others two or three, or even one or none, according to the number of ovules which have previously been fertilised. The small white specks visible where peas have failed to develop in the pod represent the infertile ovules. By the aggregation of the pollen grains and their transference as pollinia this difficulty is to a large extent overcome. Hence the many-seeded habit of both the Cotton-bushes and the Orchids.

Unlike Orchids, however, the seeds of which are of extremely small size, the Cotton bushes produce seeds which are moderately large and apparently of high germination capacity. Moreover they are provided each with a tuft of hairs which facilitates their dispersal by a mechanism similar to that found in the Thistles. Indeed, the seed of *Asclepias* is extraordinary like the apparent seed—in reality the fruit or *achene*—of a Composite; the tuft of hairs is in every way analogous to the *pappus*, or ring of hairs attached to the fruit of a Thistle. Regarded as weeds, and from the practical viewpoint of their eradication, the Cotton-bushes must be placed within the same category as perennial Thistles; their effective control is dependent upon the prevention of seed formation. Now it is interesting to note that, just as the *Orchidaceae* is considered to be the most highly evolved and specialised family of Monocotyledonous plants, so, amongst the Dicotyledons, pride of place is usually given to the *Compositae* or Thistle family. In combining the elaborate pollination mechanism of the one, therefore, with the extremely efficient seed dispersal arrangements of the other, the Cotton-bushes would appear to have "picked the eyes," so to speak, of the two most advanced families of flowering plants.

The seeds of *Asclepias* are produced in pod-like fruits or follicles, formed by enlargement of one or both carpels of the flower. These carpels, though at first united by the tips of their styles, are otherwise quite free, and occupy a cavity in the interior of the column (Figure G). The column is soon ruptured by the growth of the carpels after fertilisation, whereupon the latter appear on the surface, and by further development and enlargement become the follicles. The mature follicle of *A. fruticosa* is more inflated than that of *A. rotundifolia* and its wall is thinner. Both are covered with soft spines which, however, are much more numerous and usually longer in the case of *A. fruticosa.* The follicle with its attached stalk representing the original flower pedicel is somewhat suggestive of the body and neck of a swan, and the structures are sometimes called "Swan-necks" by children. The ripe follicle is ovoid in shape, about 1½in. in length, and tapers to a point. The seeds, when ripe, are set free by rupture of the follicles down one side of its length.

The resemblance, as regards seeding habits, between the Cotton-bushes and the Thistles has been brought about in fundamentally different ways in the two families concerned. In the *Asclepiadaceae* the many-seeded character is actually present; but in the *Compositae* the advantages of such a character have been acquired in an indirect way, namely, by reduction in size and massing of the flowers into compact inflorescences. Actually the flower of *Compositae* produces only a single

seed; but, by the aggregation together of numerous small flowers, there results a *many-fruited type of head* which is analogous to the *many-seeded fruit* of a Cotton-bush. The likeness is completed by the assumption of similar characters by the fruits of the one and the seeds of the other.

PROPERTIES AND USES.

A very large number of Asclepiads are poisonous, and this is almost certainly true of the two Cotton-bushes.* While definite information is wanting in the case of *A. rotundifolia,* foliage and flowers of *A. fruticosa* have been shown by experiment to be fatal to rabbits. Steyn reports that forty grams of the fresh flowers, leaves, and upper parts of the stems, caused death in a rabbit two hours after administration. The nature of the poisonous principle in these plants is unknown, but the symptoms produced are those of intense gastro-intestinal irritation. Neither plant is voluntarily eaten by stock.

Apparently *A. fruticosa* has some uses as a medicinal plant. The leaves are reported to have been used as a purgative. Watt and Breyer-Brandwyk, quoted by Steyn, state that:—

> The Sutos use scrappings from the dried stem as a sternutatory in fainting and Phillips states that they use the plant as a remedy for coryza. Of recent years the powdered leaf has come into common use among Europeans as a snuff for the treatment of pulmonary tuberculosis.

The silky hairs attached to the seeds of the same species are sometimes used as kapok.

CONTROL AND ERADICATION.

Apart from their poisonous properties, the Cotton-bushes are to be regarded as undesirable plants on account of their ability to displace the native vegetation in situations where the preservation of the latter is most to be desired. It does not seem likely that either species will become a serious weed of arable land, or of pasture country, except perhaps on rocky hillsides and other inaccessible parts. But they are weeds of hillsides and gullies in situations which might with advantage be kept as public reserves and as sanctuaries for the preservation of the native flora and fauna. The narrow-leaved species does not appear to have established itself, as yet, over a very wide area, but it does occur in a few places, as, for example, along the gorge of the Onkaparinga River. The broad-leaved species does, however, cover a very large area. It occurs along the Torrens Gorge and in many other parts of the Adelaide hills and foothills. Doubtless the spread of this plant in the past has been very materially assisted by the extensive destruction of native herbs and shrubs from time to time by bush fires. The prevention of such outbreaks of fire during the hot summer months offers perhaps the most effective means of preventing the further spread of this Cotton-bush.

Eradication of individual plants, where such is required, does not present serious difficulty. Like Thistles they should be prevented from forming and dispersing their seeds. The plants should either be grubbed right out or else exhausted by repeated cutting. The Broad-leaved Cotton-bush flowers during the winter months and should be attacked during this period; the Narrow-leaved species, which flowers in the late spring and summer, is best cut down during November or December.

REFERENCE.—Steyn, D. G., "The Toxicology of Plants in South Africa," Central News Agency, South Africa, 1934, page 339.

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* This applies also to *A. physocarpa* (Steyn, loc. cit. page 341) and *A. curassavica* (H. R. Seddon, quoted by C. White, *Queensland Agricultural Journal*, 43, page 415, April, 1935).

VARIETIES OF WHEAT SOWN, SEASON 1935-36.

[A. W. BOWDEN, Acting Government Statist.]

1. The Acting Government Statist reports that 1[illegible] (183) varieties of wheat were sown for the wheat crop of the Season 1935-36. Th[illegible]tal acreage sown for grain, hay, and fodder was 3,210,238 (3,459,380), of which the varieties were not specified for 80,779 (106,676) acres.

2. Particulars of the most popular varieties are given at foot hereof. The first position is occupied by Ranee with a percentage of 18.09 (14.31) having displaced Nabawa which had held first place since the 1931-32 season. Nabawa ranks second on the list, its percentage being 17.56 (19.73), with Sword, Waratah, Gluyas, and Ford following in that order; Gallipoli has dropped from third to seventh position, while Merridin, a West Australian wheat, has risen from fifteenth to tenth position; Aussie and Quality also rank higher than formerly, while Currawa, Late Gluyas, Sultan, and Federation are falling back. Of the remainder Ghurka has gone from ninth to eighth place with a percentage of 3.82 (1.97), while Dan, Felix, and Florence remain about the same. In the lesser varieties Bencubbin (Early Gluyas x Nabawa) has increased from 3,162 acres to 10,462 acres, and Dundee (Hard Federation x Cleveland x Sands) showed a sowing of 8,548 acres as against only 140 last year.

3. The leading varieties favoured in each of the Divisions and their percentages to the total were:—

Central.—Sword 24, Ranee 16, Nabawa 14, Waratah 7, Ford 7, Ghurka 5.
Lower North.—Ranee 23, Sword 16, Nabawa 12, Ford 7, Waratah 6, Ghurka 5.
Upper North.—Ranee 45, Nabawa 16, Federation 5, Gluyas 4, Sword 4, Waratah 3.
South-Eastern.—Ghurka 24, Ranee 20, Gallipoli 16, Ford 9, Sword 5, Nabawa 5.
Western.—Nabawa 24, Gluyas 12, Waratah 10, Late Gluyas 8, Ranee 6, Ford 6.
Murray Mallee.—Nabawa 19, Ranee 17, Gallipoli 12, Sword 7, Gluyas 6, Waratah 5.

4. Leading varieties of wheat sown 1935-36 and 1934-35.

Variety.	Total Area Sown for Grain, Hay, &c.		Percentage to Total.		Relative Position.	
	1935-36.	1934-35.	1935-36.	1934-35.	1935-36.	1934-35.
Ranee	580,833	495,175	18·09	14·31	1	2
Nabawa	563,652	682,464	17·56	19·73	2	1
Sword	360,686	277,715	11·23	8·03	3	4
Waratah	221,607	241,559	6·90	6·98	4	5
Gluyas	191,559	219,069	5·97	6·33	5	6
Ford	175,439	214,317	5·46	6·20	6	7
Gallipoli	141,999	295,503	4·42	8·54	7	3
Ghurka	122,484	68,232	3·82	1·97	8	9
Late Gluyas	86,390	125,936	2·69	3·64	9	8
Merridin	55,033	41,109	1·71	1·19	10	15
Dan	51,969	57,350	1·62	1·65	11	11
Aussie	48,807	45,835	1·53	1·33	12	14
Currawa	46,031	57,370	1·43	1·65	13	10
Quality	41,774	26,048	1·30	0·75	14	18
Sultan	34,282	47,765	1·07	1·38	15	13
Felix	33,697	39,606	1·05	1·15	16	16
Federation	31,824	48,401	0·99	1·40	17	12
Florence	27,156	26,774	0·85	0·77	18	17
Other and unspec.	395,016	449,152	12·31	13·00	—	—
	3,210,238	3,459,380	100·00	100·00	—	—

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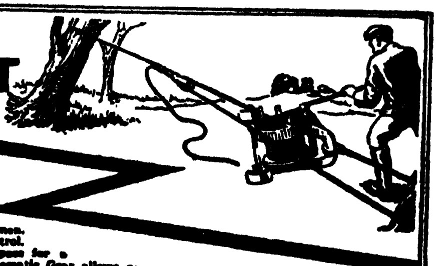

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SOUTHERN DISTRICTS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MAY, 1936.

Herd No.	No. of Cows in Herd.	No. of Cows in Milk.	Milk.			Butterfat			Average Test.
			Per Herd during May.	Per Cow during May.	Per Cow March to May.	Per Herd during May.	Per Cow during May.	Per Cow March to May.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
9/A	30	22·29	11,688½	389·62	1,232·76	706·17	23·54	72·12	6·04
9/C	16	14·23	6,723½	420·21	1,247·68	316·72	19 80	56·21	4·71
9/D	29·29	18·71	9,931½	339·07	1,119·97	545·69	18·63	59·20	5·49
9/E	12	11·26	4,797	399·75	1,403·29	241·46	20·12	67·58	5·03
9/F	17·48	12·10	6,910	395·30	780·32	306·57	17·54	34·47	4·44
9/I	26·87	17·68	8,737½	324·96	731·04	363·85	13·53	32·89	4·20
9/L	30·16	10·52	6,917½	229·36	395·96	287·15	9·52	17·21	4·15
9/O	27	19	10,106	374·28	999·63	460·97	17·07	46·06	4 56
9/P	43·87	27·61	17,126½	390·64	954·14	790·58	18·03	48·27	4·62
9/W	27·84	18·77	13,364½	480·04	1,443·14	621·54	22 33	61 85	4·65
9/X	13	9·16	3,237½	249·04	567·31	149·61	11 51	29 11	4·62
9/Y	12	8·06	4,611	384·25	1,055·12	193·51	16·13	43·11	4·20
9/Z	12	8·35	3,838½	319·87	711·36	206·03	17·17	39·35	5·37
9/Aa	11	3·94	1,542	140·18	403 12	89·93	8·18	22·11	5·84
9/Bb	32	29·68	15,322	478·81	1,544·46	831·42	25·98	81·41	5·43
9/Ee	57·39	40·84	13,020	227·16	584·49	602·70	10·52	29·10	4·64
9/Gg	9	8	4,215½	468·39	1,160·51	246·36	27·37	66·82	5·84
9/Hh	12	9	2,542	211·83	590·62	129·58	10·80	30·80	5·10
9/Ii	37	27·06	7,461	201·65	751·47	414·37	11·20	40·77	5·55
9/Jj	18·48	15·84	8,023	434·14	1,112·44	382·60	20 70	53·74	4·77
9/Kk	17	12·87	3,765	221·47	677·70	161·10	9·48	28 73	4·28
9/Ll	12·61	6	7,074½	567·84	567·84	284 69	22·84	22 84	4·03
Means	22·91	15·95	7,770·66	339·20	886·79	378·75	16·53	43·69	4·87

LAKE ALBERT AND JERVOIS HERD TESTING ASSOCIATION (formerly Lake Albert).

RESULTS OF BUTTERFAT TESTS FOR MAY. 1936

Herd No.	No. of Cows in Herd.	No. of Cows in Milk.	Milk			Butterfat			Average Test.
			Per Herd during May.	Per Cow during May.	Per Cow December to May.	Per Herd during May.	Per Cow during May.	Per Cow December to May.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B	15·52	12·48	8,420½	543·14	2,260·43	421·98	27·19	110·54	5 01
6/C	23·97	18·71	12,781½	533·22	3,598·60	502 36	20·96	155 55	3 93
6/Y	14	14	8,695½	621·11	4,733·23	352·55	25·18	198·36	4·05
6/Ff	32·77	29·81	18,104½	552·47	4,385·79	755·80	23·67	180·53	4·28
6/Kk	16·19	13·19	6,575½	406·16	2,780·02	281·74	17·41	110·61	4·28
6/Ll	24	19·94	8,637½	359·89	3,254·10	336·12	14·01	118·02	3 89
6/Oo	21·13	16·97	12,239½	579·24	4,111·74	523·14	24·76	175·70	4·27
6/Ss	19	16·39	14,874	782·84	5,223·48	518·73	27·30	185·72	3·49
6/Tt	26·71	25·35	14,593½	546·36	4,102·80	601·77	22 53	169·70	4·12
6/Vv	29·94	25·68	20,617	683·66	4,739·32	927·16	30·72	217·21	4·50
6/Xx	26·06	21·10	13,997½	537·12	3,796·91	582·28	22·34	153·14	4·16
6/Ddd	25	22·35	13,102	524·08	3,854·54	508·49	20·34	156·35	3·88
6/Mmm	10	9	7,688	768·80	4,563·04	314·58	31·46	181·03	4·09
5/Ooo	27·52	25·16	19,824	720·35	4,782·66	803·14	29·18	201·25	4·05
6/Rrr	39	33·20	22,284½	571·40	4,020·32	919·50	23·58	159·50	4·13
6/Sss	35·61	29·03	21,710½	609·67	4,477·33	821·99	23·08	172·73	3·79
6/Ttt	27	21·29	16,424½	608·31	3,687·55	773·40	28·64	170·41	4·71
6/Pp	24·29	17·81	11,845½	487·66	3,556·77	581·10	23·92	177·12	4·91
6/Uuu	66·87	56·03	31,697	474·01	3,783·03	1,276·82	19·09	160·72	4·03
6/Vvv	40	33·90	16,470	411·75	3,548·85	662·80	16·57	137·78	4·02
6/A	10	4·52	1,231½	123·15	1,522·85	59·37	5·94	79·47	4·82
6/Ppp	24·10	19·16	16,326	677·40	4,639·96	633·61	26·29	189·77	3·88
6/Www	33·19	27·94	15,471	466·13	1,584·46	636·10	19·17	62·77	4·11
Means	26·60	22·31	14,505·22	545·25	3,926·70	599·76	22·55	162·61	4·13

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MAY, 1936.

Herd No.	No. of Cows in Herd.	No. of Cows in Milk	Milk.			Butterfat.			Average Test.
			Per Herd during May	Per Cow during May	Per Cow October to M	Per Herd during May.	Per Cow during May	Per Cow October to May.	
						Lbs.	Lbs.	Lbs.	%
5/C ..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	906·84	25·[illegible]	240·01	5·01
5/D ..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,0[illegible]5·35	29·[illegible]	203·20	5·43
5/E ..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	819·11	21·6[illegible]	214·95	5·36
5/R ..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]69·41	24·[illegible]	152·37	4·56
5/Z ..	42·6[illegible]	39·2[illegible]	22,9[illegible]	[illegible]	[illegible]	1,096·62	39·79	276·27	5·14
5/EE	16	11·52	3,914½	244·65	4,667·83	234·23	14·64	241·61	5·98
5/XX	26	13·97	10,497	403·73	2,901·61	531·52	20·45	149·49	5·08
5/YY	8	6·58	5,602	700·24	3,188·07	298·83	37·35	168·90	5·33
5/AAA	19	9·90	7,004	368·63	4,190·67	378·04	19·90	212·60	5·40
5/BBB	18	11·74	4,857½	269·86	3,076·77	267·12	14·84	156·40	5·50
5/EEE	26	16·65	11,828½	454·93	3,936·95	548·11	21·08	176·79	4·63
5/HHH	13·06	10·16	4,620	353·75	3,712·72	195·09	14·94	156·59	4·22
5/JJJ	25·87	16·81	13,249	512·91	2,781·06	664·58	25·72	160·71	5·08
5/AA .	17	10·71	5,677½	333·97	3,925·67	282·71	16·63	175·31	4·98
5/KKK	16·87	12·52	6,024	357·08	2,548·27	295·24	17·50	124·00	4·90
5/LLL	14·74	10·71	6,348½	430·69	3,714·14	288·15	19·55	166·55	4·54
5/RR	23	15·39	8,681½	377·46	3,256·49	444·33	19·32	172·79	5·12
5/MMM	32·45	22	15,360	473·[illegible]	1,749·09	769·95	23·73	229·45	5·01
5/NNN	2[illegible]	1[illegible]	[illegible]	[illegible]	[illegible]	481·36	19·25	198·44	5·44
						731·30	[illegible]·00	273·58	4·67
						395·46	[illegible]18	127·13	3·90
						551·05	[illegible]01	166·63	5·44
						614·29	[illegible]21	190·88	4·99

61% for April The correct figure should be

[illegible]NG ASSOCIATION.

[illegible]TS FOR MA[illegible]36.

H[illegible]						[illegible]rfat.			Average Test.
						Per Herd during May.	Per Cow during May.	Per Cow July [illegible]	
						Lbs.	Lbs.		
7/H				[illegible]	[illegible]18	476·10	22·0[illegible]	[illegible]	[illegible]
7/P ..			[illegible]	[illegible]	[illegible]	[illegible]09	22·[illegible]	[illegible]	[illegible]
7/TT .				[illegible]	[illegible]	[illegible]	16·[illegible]	[illegible]	[illegible]
7/DDD	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/BBB	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/EEE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/GGG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/HHH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/III	2[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/KKK	2[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/MMM	15·[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/NNN	15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/OOO	27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/PPP	20·12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/QQQ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/RRR	2[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/SSS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/TTT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/UUU	21·[illegible]	[illegible]	6,020	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/VVV	20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/WWW	19	[illegible]	8,100	126·32	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/XXX	25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Means	20·[illegible]	[illegible]	[illegible]17·20	367·87	5,62[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1936-37.

CONDUCTED AT PARAFIELD POULTRY STATION.

ONLY FIRST GRADE EGGS RECORDED.

SECTION 1.—WET MASH.

Class No. 1.—White Leghorns—351 *Birds Competing.*

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
A. G. Dawes, Portrush Road, Glenunga.	1	11	
	2	38	
	3	32	81
	4	23	
	5	45	
	6	57	125
			206
A. Young, Bridgewater.	7	42	
	8	53	
	9	56	151
	10	34	
	11	42	
	12	39	115
			266
H. F. Muirson, Yundi.	13	7	
	14	46	
	15	dead	53
	16	53	
	17	32	
	18	54	139
			192
T. E. Hincks, Echunga.	19	24	
	20	27	
	21	26	77
	22	45	
	23	22	
	24	48	115
			192
John Turner, Meadows.	25	57	
	26	52	
	27	30	139
	28	38	
	29	58	
	30	55	151
			290
[illegible] Duhring, [illegible]allala.	31	53	
	32	56	
	33	50	159
	34	48	
	35	21	
	36	59	128
			287
[illegible] Road, [illegible] No. 4—Rhode [illegible] Ro[illegible]	37	53	
	38	50	
	39	52	155
	40	12	
	41	33	
	42	22	67
			222
[illegible]rshall,	43	51	
	44	6	
	45	36	93
	46	43	
	47	42	
	48	1	86
			179
F. A. Merrett, Echunga.	49	49	
	50	10	
	51	40	99
	52	45	
	53	63	
	54	61	169
			268
E. Portlock, Meadows.	55	58	
	56	65	
	57	46	169
	58	47	
	59	49	
	60	35	131
			300
E. O. Dorney, 16, Norseman Avenue, Westbourne Park.	61	55	
	62	5	
	63	44	104
	64	21	
	65	25	
	66	27	73
			177
A. E. Shiers, Yundi.	67	37	
	68	43	
	69	55	135
	70	58	
	71	53	
	72	53	164
			299
G. W. T. Symes, Echunga.	73	40	
	74	55	
	75	50	145
	76	47	
	77	42	
	78	56	145
			290
J. F. Smith, Meadows.	79	43	
	80	41	
	81	45	129
	82	39	
	83	49	
	84	17	105
			234
Arthur O. Dawkins, "Warrenbeyne", Gawler.	85	64	
	86	58	
	87	56	178
	88	38	
	89	61	
	90	70	169
			347
Geo. Lomax, Yundi.	91	35	
	92	38	
	93	15	88
	94	22	
	95	52	
	96	43	117
			205

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive to 30th June, 1936.	Totals
A. W. Mooney, Echunga.	97	22	
	98	48	
	99	42	112
	100	37	
	101	51	
	102	38	126
			238
H. C. Stacy, Meadows.	103	40	
	104	43	
	105	50	133
	106	47	
	107	39	
	108	31	117
			250
V. E. Williams, 57, Fairford Terrace, Semaphore Park.	109	67	
	110	52	
	111	21	140
	112	40	
	113	41	
	114	52	133
			273
T. R. Smart, Yundi.	115	48	
	116	26	
	117	55	129
	118	dead	
	119	33	
	120	50	83
			212
C. T. Rodger, Echunga.	121	61	
	122	3	
	123	52	116
	124	45	
	125	38	
	126	43	126
			242
R. J. Underdown, Meadows.	127	43	
	128	56	
	129	34	133
	130	57	
	131	3	
	132	54	114
			247
B. Cooke, Kanmantoo.	133	—	
	134	61	
	135	51	112
	136	61	
	137	9	
	138	49	119
			231
W. M. Field, Yundi.	139	50	
	140	35	
	141	18	103
	142	26	
	143	45	
	144	59	130
			233
W. Restall, Echunga.	145	58	
	146	54	
	147	11	123
	148	14	
	149	46	
	150	45	105
			228

Competitor.	Bird No.	First Grade Eggs. Progressive to 30th June, 1936.	Totals
F. W. Gage, Meadows.	151	43	
	152	36	
	153	50	129
	154	54	
	155	57	
	156	43	154
			283
E. McKee, 5, Rose Street, Carrondown	157	47	
	158	46	
	159	dead	93
	160	51	
	161	63	
	162	53	167
			260
W. C. Jones, Yundi.	163	30	
	164	44	
	165	37	111
	166	25	
	167	42	
	168	49	116
			227
D. J. Foxwell Echunga.	169	61	
	170	56	
	171	22	139
	172	44	
	173	29	
	174	41	114
			253
W. Sickert, Meadows.	175	52	
	176	43	
	177	63	158
	178	48	
	179	20	
	180	51	119
			277
Willow Bend Stud Poultry Farm, North Walkerville.	181	2	
	182	58	
	183	44	104
	184	55	
	185	52	
	186	64	171
			275
C. Guthridge, Yundi.	187	37	
	188	58	
	189	44	139
	190	50	
	191	39	
	192	43	132
			271
S. Lambert, Echunga.	193	26	
	194	61	
	195	54	141
	196	48	
	197	36	
	198	58	142
			283
G. W. Sykes, Yundi.	199	35	
	200	57	
	201	7	99
	202	40	
	203	—	
	204	44	84
			183

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
J. J. Devlin, Meadows.	205	19	
	206	54	
	207	39	112
	208	21	
	209	45	
	210	35	101
			213
B. R. Whitington, Yundi.	211	34	
	212	48	
	213	51	133
	214	34	
	215	56	
	216	32	122
			255
L. A. King, Meadows.	217	51	
	218	34	
	219	43	128
	220	4	
	221	43	
	222	49	96
			224
W. R. Hedger, Yundi.	223	44	
	224	32	
	225	45	121
	226	55	
	227	—	
	228	4	59
			180
A. K. Suridge, Meadows.	229	1	
	230	18	
	231	43	62
	232	60	
	233	32	
	234	25	117
			179
J. C. Normandale Yundi.	235	45	
	236	40	
	237	54	139
	238	50	
	239	46	
	240	40	136
			275
E. G. Mitchell, Meadows	241	50	
	242	18	
	243	52	120
	244	36	
	245	25	
	246	51	112
			232
R. W. McAlister, Yundi.	247	58	
	248	46	
	249	53	157
	250	59	
	251	39	
	252	37	135
			292
C. R. Wharton, Meadows.	253	22	
	254	52	
	255	44	118
	256	13	
	257	43	
	258	54	110
			228
R. H. Smith. Yundi.	259	40	
	260	52	
	261	29	121
	262	19	
	263	49	
	264	63	131
			252
F. J. Buck, Meadows.	265	1	
	266	38	
	267	54	93
	268	48	
	269	29	
	270	27	104
			197
E. B. Gliddon, Yundi.	271	54	
	272	45	
	273	49	148
	274	36	
	275	63	
	276	24	123
			271
C. MacDonald, Echunga.	277	58	
	278	63	
	279	39	160
	280	58	
	281	39	
	282	50	147
			307
J. A. Grist, Yundi.	283	dead	
	284	47	
	285	28	75
	286	21	
	287	50	
	288	52	123
			198
J. M. Lawson, Meadows.	289	24	
	290	38	
	291	55	117
	292	43	
	293	5	
	294	39	87
			204
Willow Bend Stud Poultry Farm, North Walkerville.	295	54	
	296	40	
	297	57	151
	298	60	
	299	48	
	300	57	165
			316
Murray Powell, Jupiter Creek.	301	3	
	302	55	
	303	14	72
	304	61	
	305	18	
	306	35	114
			186
W. H. L. Norman, Echunga.	307	67	
	308	52	
	309	55	
		174	

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.
A. A. Schroeder, Montarra.	310	29
	311	47
	312	56
		132
C. A. Maxwell, Aldgate.	313	50
	314	21
	315	63
		134
B. T. Moyle, Montarra.	316	57
	317	32
	318	54
		143
J. H. Dowling, Glossop.	319	54
	320	7
	321	60
		121
C. P. Hill, Montarra.	322	53
	323	1
	324	51
		105
A. P. Urlwin, Balaklava.	325	50
	326	36
	327	49
		135
G. H. Stockwell, Montarra.	328	14
	329	44
	330	4
		62
A. W. McDonald, Angle Vale Road, Gawler.	331	63
	332	41
	333	46
		150
E. A. Collins, Montarra.	334	54
	335	68
	336	50
		172
E. M. Horrocks, Clare.	337	40
	338	43
	339	57
		140
H. A. Dedman, Montarra.	340	49
	341	40
	342	13
		102
E. M. Topperwein, 1, Medway Street, Fullarton Estate.	343	38
	344	54
	345	31
		123
Jas. G. Slee, Montarra.	346	61
	347	18
	348	65
		144
A. S. Weaver, Montarra.	349	34
	350	56
	351	14
		104
F. R. Walker, Montarra.	352	50
	353	52
	354	37
		139
F. G. Kinnish, Montarra, *via* Willunga.	355	47
	356	5
	357	52
		104
Total Class No. 1		14,613

Class No. 2—Any Other Light Breed (Minorcas)—15 Birds Competing.

Competitor.	Bird No.	First Grade Eggs.	
Langmaid & Bettison, Salisbury.	358	33	
	359	24	
	360	32	89
	361	14	
	362	1	
	363	20	35
			124
V. F. Gameau, 71, Findon Road, Woodville.	364	19	
	365	32	
	366	36	87
	367	28	
	368	9	
	369	16	53
			140
R. M. Yelland, Cunliffe.	370	4	
	371	28	
	372	37	
		69	
Total Class No. 2.			333

Class 3—Black Orpingtons—45 Birds Competing.

Competitor.	Bird No.	First Grade Eggs.	
A. G. Dawes, Portrush Road, Glenunga.	373	52	
	374	45	
	375	47	144
	376	25	
	377	55	
	378	50	130
			274
Willow Bend Stud Poultry Farm, North Walkerville.	379	62	
	380	41	
	381	49	152
	382	69	
	383	55	
	384	61	185
			337
H. J. Mills, 108, Edward Street, Edwardstown.	385	5	
	386	31	
	387	40	76
	388	45	
	389	27	
	390	48	120
			196
K. Pennack, Pooraka.	391	50	
	392	47	
	393	32	129
	394	48	
	395	48	
	396	58	149

EGG-LAYING COMPETITION—continued.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
H. H. Gallagher, **Pooraka.**	397	42	
	398	57	
	399	36	135
	400	44	
	401	8	
	402	53	105
			240
V. E. Williams, **57, Fairford Terrace,** **Semaphore Park.**	403	44	
	404	28	
	405	36	
	405		
		108	
J. H. Dowling, **Glossop.**	406	43	
	407	8	
	408	10	
		61	
A. P. Urlwin, **Box 80,** **Balaklava**	409	28	
	410	1	
	411	12	
		41	
J. Rawe, **Seaton Park.**	412	54	
	413	28	
	414	23	
		105	
Raymoor Poultry Farm, **William Street,** **Kilkenny.**	415	47	
	416	20	
	417	38	
		105	
Total Class No. 3.		1,745	

Class No. 4—Any Other Heavy Breed—36 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
A. G. Dawes, **Portrush Road,** **Glenunga.** **(Rhode Island Reds)**	418	10	
	419	56	
	420	18	84
	421	62	
	422	51	
	423	53	166
			250
Willow Bend Stud **Poultry Farm** **North Walkerville.** **(Rhode Island Reds.)**	424	58	
	425	23	
	426	54	135
	427	4	
	428	23	
	429	64	91
			226
V. F. Gameau, **71, Findon Road,** **Woodville.** **(Rhode Island Reds.)**	430	25	
	431	20	
	432	—	45
	433	27	
	434	48	
	435	45	120
			165
K. Pennack, **Pooraka** **(Barnevelders.)**	436	44	
	437	38	
	438	43	125
	439	52	
	440	18	
	441	59	129
			254
Raymoor Poultry Farm, **William Street,** **Kilkenny.** **(Rhode Island Reds.)**	442	32	
	443	32	
	444	45	
		109	
Eric F. Snow, **18, Mt. Barker Road,** **Glen Osmond.** **(Rhode Island Reds.)**	445	23	
	446	5	
	447	43	
		71	
Total Class No. 4.		1,075	

SECTION 2—DRY MASH.

Class No. 5—White Leghorns—15 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
Arthur O. Dawkins, **" Warrenbayne ",** **Gawler.**	448	47	
	449	69	
	450	57	173
	451	60	
	452	58	
	453	57	175
			348
Willow Bend Stud **Poultry Farm,** **North Walkerville.**	454	68	
	455	51	
	456	60	179
	457	62	
	458	42	
	459	21	125
			304
A. J. Monkhouse, **Woodside.**	460	18	
	461	45	
	462	40	
		103	
Total Class No. 5.		755	

Class No. 7.—Black Orpingtons—6 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
Willow Bend Stud **Poultry Farm,** **North Walkerville.**	463	62	
	464	21	
	465	37	120
	466	52	
	467	52	
	468	65	169
			289
Total Class No. 7			289

Class No. 8.—Rhode Island Reds—6 Birds Competing.

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.	
Willow Bend Stud **Poultry Farm,** **North Walkerville.**	469	45	
	470	73	
	471	64	182
	472	67	
	473	61	
	474	61	189
			371
Total Class No. 8			371

EGG-LAYING COMPETITION—continued.

SECTION 9—WET MASH.

Class No. 9.—Any Breed—27 Birds Competing.
(Home Project Utility Section).

Competitor.	Bird No.	First Grade Eggs. Progressive Totals to 30th June, 1936.
Peter Western, Ascot Park School. (White Leghorn.)	475	52
Peter Western, Ascot Park School. (White Leghorn.)	476	36
Stanley Pratt, Abattoirs School. (White Leghorn.)	477	49
Anthony Rix, Williamstown. (White Leghorn.)	478	58
John Short, Hamley Bridge School. (White Leghorn.)	479	62
Marion Brooks, Sandy Creek School. (White Leghorn.)	480	—
Owen Robinson, Ascot Park School. (White Leghorn.)	481	48
Eric Sincock, 133, Anzac Highway, Grassmere. (White Leghorn).	482	26
Reg W. Andrew, 61, South Road, Black Forest. (White Leghorn.)	483	55
Robert Fulton, 11, Glengarry Avenue, Glandore. (White Leghorn.)	484	22
Ray Couche, Thebarton School. (White Leghorn.)	485	53
Warren Hannaford, Paracombe School. (White Leghorn.)	486	52
Herbert Gwynne, Gawler School. (White Leghorn.)	487	29
Robert H. King, Tarlee School. (White Leghorn.)	488	30
Stanley W. Pethick, Ascot Park School. (White Leghorn.)	489	46
William Horne, Woodville High School. (White Leghorn.)	490	54
Bernice Jennings Mylor School. (White Leghorn.)	491	30
Ross. W. Schulz, Willunga School. (White Leghorn.)	492	12
Gordon Heard, Camden School. (White Leghorn.)	493	44
Laurel White, Williamstown School. (Black Orpington.)	494	51
David Hart, Unley High School. (Black Orpington.)	495	71
Bob Sweetland, Thebarton School. (Black Orpington.)	496	28
Malcolm Booth, Bridgewater School. (Black Orpington.)	497	44
Keith Oliver, McLaren Vale School. (Black Orpington.)	498	52
Colin Kies, Sandy Creek School. (Minorca.)	499	8
Alan Yelland, Cunliffe. (White Leghorn.)	500	47
Kenneth Ekers, Mt. Compass. (Black Orpington.)	501	68
Total Class No. 9		1,127

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1936-37, CONDUCTED AT PARAFIELD POULTRY STATION.

LEADING SCORES TO WEEK ENDED 30th JUNE, 1936.—FIRST GRADE EGGS ONLY.

SECTION I.—WET MASH.

Class 1.—White Leghorns.

(351 birds competing.)

	Eggs Laid.	Bird Nos.
Singles—		
A. O. Dawkins	70	90
E. A. Collins	68	335
V. E. Williams	67	109
W. H. L. Norman	67	307
Trios—		
A. O. Dawkins	178	85–87
W. H. L. Norman	174	307–309
E. A. Collins	172	334–336

Class 1.—White Leghorns—continued.

	Eggs Laid.	Bird Nos.
Teams—		
A. O. Dawkins	347	85–90
Willow Bend Stud Poultry Farm	316	295–300
C. MacDonald	307	277–282

Class 2—Any Other Light Breed.

(Minorcas—15 birds competing.)

Singles—		
R. M. Yelland	37	372
V. F. Gameau	36	366
Langmaid and Bettison	33	358
Trios—		
Langmaid and Bettison	89	358–360
V. F. Gameau	87	364–366
Teams—		
V. F. Gameau	140	364–369
Langmaid and Bettison	124	358–363

Class 3.—Black Orpingtons.

(45 birds competing.)

Singles—		
Willow Bend Stud Poultry Farm	69	382
Willow Bend Stud Poultry Farm	62	379
Willow Bend Stud Poultry Farm	61	384
Trios—		
Willow Bend Stud Poultry Farm	185	382–384
Willow Bend Stud Poultry Farm	152	379–381
K. Pennack	149	394–396
Teams—		
Willow Bend Stud Poultry Farm	337	379–384
K. Pennack	278	391–396
A. G. Dawes	274	373–378

Class 4.—Any Other Heavy Breed.

(36 birds competing.)

Single—		
Willow Bend Stud Poultry Farm (Rhode Island Reds)	64	429
A. G. Dawes (Rhode Island Reds)	62	421
K. Pennack (Barnevelders)	59	441
Trios—		
A. G. Dawes (Rhode Island Reds)	166	421–423
A. G. Dawes (Rhode Island Reds)	155	37–39
Willow Bend Stud Poultry Farm (Rhode Island Reds)	135	424–426
Teams—		
K. Pennack (Barnevelders)	254	436–441
A. G. Dawes (Rhode Island Reds)	250	418–423
Willow Bend Stud Poultry Farm (Rhode Island Reds)	226	424–429

SECTION II.—DRY MASH.

Class 5.—White Leghorns.

(15 birds competing.)

Singles—		
A. O. Dawkins	69	449
Willow Bend Stud Poultry Farm	68	454
Willow Bend Stud Poultry Farm	62	457
Trios—		
Willow Bend Stud Poultry Farm	179	454–456
A. O. Dawkins	175	451–453
A. O. Dawkins	173	448–450
Teams—		
A. O. Dawkins	348	448–453
Willow Bend Stud Poultry Farm	304	454–459

Class 7.—Black Orpingtons.

(6 birds competing.)

	Eggs Laid.	Bird Nos.
***Singles*—**		
Willow Bend Stud Poultry Farm	65	468
Willow Bend Stud Poultry Farm	62	463

Class 8.—Rhode Islands Reds.

(6 birds competing.)

***Singles*—**		
Willow Bend Stud Poultry Farm	73	470
Willow Bend Stud Poultry Farm	67	472
***Trios*—**		
Willow Bend Stud Poultry Farm	189	472–474
Willow Bend Stud Poultry Farm	182	469–471
***Teams*—**		
Willow Bend Stud Poultry Farm	371	469–474

SECTION III.—WET MASH.

Class 9.—Any Breed (Home Project Utility Section).

(27 birds competing.)

Name.	School.	Breed.	Eggs Laid.	Bird Nos.
David Hart,	Unley High	(Black Orpington) ..	71	495
Kenneth Ekers,	Mount Compass	(Black Orpington)	68	501
John Short,	Hamley Bridge	(White Leghorn) ..	62	479

FEEDING TESTS AT PARAFIELD POULTRY STATION.

[New Series of Tests by C. F. ANDERSON, Government Poultry Expert.]

In continuing the experimental feeding tests at Parafield Poultry Station, a new series of tests commenced on 1st April, 1935. Five tests each of 50 white Leghorn pullets were selected. The pullets were chosen as nearly even in age, type, and maturity as was possible.

In order to gain further information on the various methods of feeding, some of the tests are similar to the series which concluded on 31st March, 1935.

The following are the methods to be adopted, together with the results from 1st April, 1935, to 30th June, 1936.

Feeding Tests commenced on 1st April, 1935.

1. Wet mash, composed of crushed barley and crushed wheat, with greenfeed and meatmeal, 2ozs. wheat per day.
2. Standard bran and pollard mash, with greenfeed and meatmeal; 1½ozs. wheat per day.
3. Bran and crushed wheat mash, with greenfeed and meatmeal; 2ozs. wheat per day.
4. Mash of crushed oats and crushed wheat with greenfeed and meatmeal; wheat, 2ozs. per day.
5. Commencing with a crushed barley and crushed wheat mash, greenfeed, meatmeal and then the feeding to be changed according to the season of the year.

	No. Eggs Laid 1st April, 1935, to 31st May, 1936.	No. Eggs Laid Month of June, 1936.	Total Eggs Laid 1st April, 1935, to 30th June, 1936.
No. 1 Test	7,893	315	8,208
No. 2 Test	8,065	334	8,399
No. 3 Test	8,700	382	9,082
No. 4 Test	7,013	238	7,251
No. 5 Test	7,179	240	7,419

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE AT CEDUNA.

Over 60 members attended the Women's Conference at Ceduna which was sponsored by the O'Loughlin Branch on 1st July. Besides the Conference there was an exhibition of cookery, handiwork, &c., when 227 exhibits were displayed.

Miss I. Hasting presided over the Conference, and papers were read by Mrs. A. Kloeden (O'Loughlin), on ''Sauces, Pickles, and Chutneys''; Mrs. E. C. Lowe (Laura Bay), ''Gardening Notes''; Miss I. Hasting (O'Loughlin), ''Health and Figure Culture.''

Miss Ellie Campbell (Inspector of Domestic Arts, Education Department) gave a demonstration in upholstery.

Prizes were awarded to the following ladies competing in the Exhibition of cookery and handiwork:—White bread—Miss D. Kloeden 1, Mrs. Reincke 2, Mrs. A. Kloeden 3; yeast buns—Mrs. S. Trewartha 1, Miss K. Blumson 2 and 3; scones—Miss D. Kloeden 1, Mrs. R. W. Burke 2, Mrs. E. L. Lutz 3; biscuits—Miss R. Blumson 1; sponge roll—Miss I. Hasting 1, Miss D. Kloeden 2, Mrs. R. W. Burke 3; jam tarts—Mrs. A. Kloeden 1 and 2, Mrs. E. L. Lutz 3; nut and currant loaf—Miss R. Blumson 1; pasties—Miss A. Kloeden 1 and 2, Miss L. Blumson 3; ribbon cake, Miss R. Blumson 1, Mrs. C. Bergmann 2, Miss I. Hasting 3; coffee cake—Miss I. Hasting 1, Miss R. Blumson 2, Mrs. E. Pfeiffer 3; pound cake—Mrs. C. Bergmann 1, Miss R. Blumson 2, Mrs. A. Kloeden 3; cream puffs—Mrs. A. Kloeden 1 and 2, Mrs. Reincke 3; sponge cake—Mrs. E. L. Lutz 1 and 2, Mrs. Reincke 3; blowaway sponge—Mrs. S. Trewartha 1, Mrs. E. L. Lutz 2 and 3; German cake—Mrs. E. Pfeiffer 1; Madiera cake—Mrs. A. Kloeden 1, Mrs. C. Bergmann 2, Mrs. E. Pfeiffer 3; ginger cake—Mrs. C. Bergmann 1, Mrs. E. Pfeiffer 2; checker roll—Mrs. A. Kloeden 1, Mrs. C. Bergmann 2, Mrs. R. Blumson 3; rainbow roll—Mrs. R. Blumson 1; mustard pickles—Miss I. Hasting 1, Mrs. C. Bergmann 2, Mrs. R. W. Burke 3; vinegar pickles—Miss R. Blumson 1, Mrs. E. C. Lowe 2; tomato chutney—Mrs. A. Kloeden 1, Mrs. A. M. Bowell 2, Miss R. Blumson 3; Worcester sauce—Mrs. E. P. Pfeiffer 1, Miss L. Blumson 2, Miss R. Blumson 3; tomato sauce—Mrs. E. Pfeiffer 1; mock ginger—Mrs. R. W. Burke 1, Mrs. A. Kloeden 2; quince jam—Miss R. Blumson 1, Mrs. A. Kloeden 2, Mrs. R. W. Burke 3; melon jam—Miss R. Blumson 1, Mrs. C. Bergmann 2, Mrs. E. C. Lowe 3; orange marmalade—Miss R. Blumson 1; tomato jam—Mrs. W. W. Bowell 1, Mrs. S. Trewartha 2; plum jam—Miss I. Hasting 1, Mrs. E. C. Lowe 2; apricot jam—Miss I. Hasting 1, Mrs. C. Bergmann 2, Mrs. A. Kloeden 3; soap—Mrs. A. Kloeden 1, Mrs. Trewartha 2; butter—Mrs. Trewartha 1, Mrs. W. W. Bowell 2, Mrs. H. Kuhlmann 3; eggs—Mrs. E. Pfeiffer 1, Mrs. Kuhlmann 2, Mrs. Reincke 3; lard—Miss I. Hasting 1, Mrs. R. W. Burke 2, Mrs. E. Pfeiffer 3; plum sauce—Miss R. Blumson 1; supper cloth—Miss T. Barnett 1, Miss E. Trewartha 2, Miss R. Schwarz 3; work cushion—Miss T. Barnett 1, Miss R. Blumson 2; tray cloth—Miss R. Blumson 1; pillow sham—Miss L. Blumson 1, Miss E. Trewartha 2, Mrs. Kuhlmann 3; table centre—Miss L. Blumson 1, Mrs. F. Foggo 2; crochet d'oyleys—Mrs. R. W. Burke 1, Miss R. Schwarz 2, Mrs. J. W. Blumson 3; vanity set—Miss L. Blumson 1, Miss T. Barnett 2, Miss R. Blumson 3; worked d'oyleys—Miss T. Barnett 1, Miss L. Blumson 2, Miss R. Blumson 3; worked apron—Mrs. R. W. Burke 1, Miss G. Trewartha 2, Miss R. Schwarz 3; princess petticoat—Mrs. R. W. Burke 1, Mrs. J. W. Blumson 2; nightgown—Miss M. R. Talbot 1, Mrs. J. W. Blumson 2 and 3; hand-sown garment—Miss G. Trewartha; house frock—Mrs. R. W. Burke 1, Mrs. J. W. Blumson 2; machine-sown apron—Mrs. R. W. Burke 1, Miss L. Schwarz 2, Mrs. J. W. Blumson 3; sugar bag article natural)—Mrs. R. W. Burke; sugar bag article (dyed)—Miss L. Schwarz 1, Mrs. R. W. Burke 2, Miss L. Blumson 3; patchwork article—Miss I. Hasting 1, Mrs. A. Kloeden 2, Mrs. A. M. Bowell 3; knitted cardigan—Mrs. E. L. Lutz 1; knitted socks—Mrs. Kuhlmann 1, Mrs. J. W. Blumson 2; article not to exceed 2s.—Miss I. Hasting 1, Miss R. Blumson 2, Mrs. E. C. Lowe 3; girls under 14 years, d'oyley—Audrey Bergmann 1; hand-sewn garment—Audrey Bergmann 1.

The Conference Secretary (Mrs. E. E. Lutz) was pleased with the response of members in regard to the attendance, the agenda, and the excellent display at the exhibition.

EYRE'S PENINSULA (WEST) CONFERENCE.

The Conference held at Ceduna on 1st July was one of the best attended meetings which the Bureau has had in the western district of Eyre's Peninsula for many years. Mr. J. S. Foggo (Chairman of the O'Loughlin Branch) presided, and the opening address was given by Professor Perkins, representing the Advisory Board of Agriculture.

Papers were read by Mr. J. W. Blumson (Laura Bay), on "Marginal Areas"; Mr. W. Barnett (Laura Bay), "Economic Disadvantages under which Primary Producers are Labouring"; Mr. E. R. Pfeiffer (O'Loughlin), "Sheep and Their Value on the Farm"; Mr. S. R. Morgan, "Plant Nutrition and its Practical Attainment." Questions on a variety of subjects were answered by departmental officers.

The following resolutions were carried:—(*a*) "That the next Conference be held at Ceduna under the auspices of the Maltee Branch." (*b*) "That this Conference is not in favour of a levy on wheat and wool for research and advertising purposes." (*c*) "Whereas the purchaser gets our wool packs free and one pound (draft) on every cwt. and is just as concerned in selling wool as we are, we consider that the buyer should forfeit one pound of wool (draft) allowance to cover the levy required for publicity and research purposes." (*d*) "That it be a recommendation to Branches responsible for Conferences to hold a field day in their respective districts on the day after the Conference."

Professor Perkins presented the trophies of the May District Crop Competition to the following winners:—Gaden and Linke (Koonibba), 83 points; L. Martin (Maltee), 79 points; P. Lange (Chinta), 78.5 points.

In the evening Mr. W. J. Spafford (Director of Agriculture) gave an illustrated address on his visit to countries in the Southern Hemisphere.

IRRIGATED FRUIT GROWERS' CONFERENCE AT RENMARK.

In opening the Annual Conference of Branches of the Agricultural Bureau along the River Murray, which was held for the first time under the auspices of the Block E branch at Renmark on 18th June, Mr. J. B. Murdoch (member of the Advisory Board of Agriculture) said it was to be regretted that along the fruit growing districts of the River, where conditions should be particularly suitable for the organisation of keen Branches of the Bureau, the blockers did not support the Bureau anything like so enthusiastically as the producers in the purely agricultural areas of the State. Compared with other primary producers, the lot of the River grower was cast in very pleasant places, but there were still tremendous possibilities attached to the progress in the River Murray Valley, and the onus was on the growers to try and further the well-being of the industry from which thy derived their livelihood.

The Bureau system was the vehicle by means of which they were enabled to meet together, and discuss those problems which were continually calling for solution. In concluding, Mr. Murdoch asked members to give more support to their district Branches of the Bureau.

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THE "HOME" TRAIN.

Work over for the day, man and maid, young and old are intent upon "getting home." All day they have been concerned with business, mostly someone else's business, for the majority of the homeward-bound travellers are salary or wage earners.

Have they—have you—found time for personal business.

The Commonwealth Savings Bank is open all day in City, Town, Village and Country Post Office, and its convenient services are therefore easily available to all.

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Note certain RD4 improvements over the former "Thirty": Five forward speeds, ranging from 1.7 to 5.4 miles per hour; new automatic bellows-type dust-seals (of distinctive "Caterpillar" design), to guard final drives; improved heat-treatment of parts and final alloy steels for even greater stamina; greater compactness and accessibility; far stronger transmission and tracks. (Former "Thirtys" are still serving after 25,000 hours of heavy drawbar work. Think how much longer these more rugged new models should last.)

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Delegates to the number of about 80 were present from Barmera, Berri, Renmark, Block E, Ramco, Waikerie, Lone Gum and Monash. The following papers were read and discussed:—"Agriculture in Germany," Dr. F. E. Meier (Renmark); "Production of Citrus Fruit for Export," Mr. R. Moss (Berri); "The Removal of Seepage Waters by Plant Growth," Mr. F. R. Arndt (District Horticultural Instructor).

Mr. A. G. Strickland, M.Sc. (Chief Horticultural Instructor) spoke on the "Investigations of the Irrigation Advisory Committee" and replied to questions relating to mottle leaf in citrus, and the application of lime to irrigated soils. Mr. W. J. Spafford (Director of Agriculture) and Mr. F. R. Arndt (Horticultural Instructor) also replied to questions. It was decided that the 1937 Conference should be held at Waikerie.

At the evening session, Mr. Spafford addressed the Conference on "A Tour of the Southern Hemisphere".

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, 24th June, there being present the Hon. A. L. McEwin, M.L.C. (Chairman), Messrs. P. J. Baily, A. J. A. Koch, A. M. Dawkins, Geo. Jeffrey, A. J. Cooke, F. Coleman, H. Wicks, R. H. Martin, S. Shepherd, W. J. Spafford (Director of Agriculture), Professor A. J. Perkins, Dr. A. E. V. Richardson (Director Waite Research Institute). and Mr. H. C. Pritchard (Secretary). An apology was received from Mr. J. W. Sandford.

New Member.—Mr. W. J. Spafford (Director of Agriculture) was welcomed as a member of the Board by the Chairman.

Congress.—The Secretary reported that Cabinet had approved of Congress to be held this year. His Excellency the Governor had consented to deliver the Opening Address.

Life Members.—Messrs. L. A. Chapple (Berri), J. J. Modystach (Wilmington), K. Jacobs (Cherry Gardens), and C. Brook (Hartley), were approved as life members of the Agricultural Bureau.

New Members.—The following names were added to the rolls of existing Branches:—Beetaloo Valley—Miss R. Curtin; Belalie Women's—Mrs. Fred. Maddock; Chapman's Bore—J. Spencer; Georgetown Women's—Mrs. R. J. McDonald, Mrs. J. A. Lyons; Mudamuckla—E. Miller; Owen Women's—Mrs. S. C. Lacey, Mrs. C. L. Marshman, Miss G. Harkness, Miss A. Harkness, Mrs. A. S. Evans, Mrs. R. McKenzie, Miss L. Hancock; Parilla Women's—Miss L. Carman; Sutherlands—P. Schiller; Warramboo Women's—Miss Melva M. Murphy, Miss C. E. Daniel; Wasleys Women's—Miss V. Currie; Yandiah Women's—Miss C. Kupke; Yurgo—Don. Martin.

Several items were taken in Committee.

FARM BLACKSMITHING.

In the course of a paper read at a meeting of the Green Patch Branch on 7th May, Mr. S. Baillie stated that the high cost of blacksmithing and the distance farmers had to travel to a blacksmith had forced many to do their own work. With a blacksmith shop most repair jobs could be satisfactorily done on the farm on days when it was too wet to work outside. The farm blacksmith shop should stand away from other buildings on account of the danger of fire. A blast could be supplied by either bellows or a forge. The latter was preferable. It took up less room, gave a good even blast, and was not likely to get out of order, as was the case with bellows. Other articles needed included an anvil, drilling machine, vice, and if possible a set of taps and dies; also some handy tools such as hand hammers (2), one 1½lbs. and one weighing about 3lbs. for heavier work, and a hacksaw. With the above tools a farmer could do most of the jobs that would arise. Either coal or charcoal could be used for fuel. Charcoal could be obtained on the farm, whereas coal had to be bought. In summer it was advisable to use coal, as charcoal gave a lot of sparks which might set fire to dry grass or old bagging close to the shop. All punches, chisels, etc. needed in the shop could be made from scrap metal bought at sales.

Mr. Baillie exhibited articles made in the farm blacksmith shop, including a welded hame-hook and eyebolt and a set of stencil plates.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

RIVER MURRAY PRUNING COMPETITIONS CHAMPIONSHIP.

For the first time since the inception of the Pruning Competitions, the championship events were this year conducted by the Mypolonga Branch. Under the able direction of Mr. Vic. Wright, Secretary of the local Bureau, the Competitions, which were held in the orchards of Messrs. J. L. Leopold and J. Victory on 7th July, were brought to a successful issue.

Approximately 200 visitors attended, included amongst whom were Messrs. J. B. Murdoch (Member of the Advisory Board of Agriculture), H. J. Crawford, C. E. Russell, C. W. Till, W. N. Twiss (representing the Dried Fruits Board), R. Fowler (Manager of the Blackwood Orchard), J. J. Odgers, Ramco (General Secretary of the River Competitions), and F. C. Richards (Asst. Secretary, Agricultural Bureau).

Judging was done by E. Leishman, of the Department of Agriculture, and Messrs. Andrew (Waikerie), W. Noles, and B. Edson, who acted as consultative judges.

RESULTS.

FRUIT TREE SECTION.

Competitor.	Branch.	Apricot. 100	Peach. 100	Pear. 100	Total. 300
A. Wedd	Mypolonga	88	92	85	265
W. Harris	Berri	88	89	87	264
A. Milde	Mypolonga	87	90	86	263
C. Curtis	Waikerie	87	88	87	262
E. Prosser	Mypolonga	86	89	87	262
F. Battams	Moorook	90	88	84	262
R. Loxton	Moorook	89	89	84	262
A. Andrew	Waikerie	84	82	90	256
E. Liddicoat	Moorook	84	84	88	256
E. Rout	Berri	84	84	87	255
G. Elliott	Waikerie	84	85	84	253
J. T. Robertson	Berri	86	80	83	249

VINE SECTION.

Competitor.	Branch.	Gordo. 100	Currant. 100	Sultana. 120	Total. 320
J. Boehm	Waikerie	92	89	106	287
A. Milde	Mypolonga	90	88	106	284
M. Walters	Waikerie	90	87	106	283
R. Loxton	Moorook	90	88	104	282
F. Fox	Berri	88	86	108	282
C. Boehm	Waikerie	88	92	101	281
W. Harris	Berri	91	92	98	281
E. Liddicoat	Moorook	91	90	99	280
E. Prosser	Mypolonga	87	86	105	278
F. Battams	Moorook	89	85	104	278
J. T. Robertson	Berri	88	86	103	277
C. Kruger	Mypolonga	90	82	102	274
W. Penny	Barmera	87	83	102	272

Trophies donated by the Royal Agricultural and Horticultural Society and the Dried Fruits Board were won by Messrs. J. Boehm, A. Wedd, and A. Milde.

LOWER NORTH CHAMPIONSHIP.

The 1936 Lower North Pruning Competition Championship was held on the property of Mr. E. J. Helbig on Thursday, 9th July. Messrs. J. L. Williams (Viticultural Instructor, R.A.C.) and E. Leishman (District Horticultural Instructor), judged the Vine Pruning, and Messrs. J. B. Harris and H. H. Orchard (District Horticultural Instructor) judged the Fruit Tree Sections.

VINE SECTION.

Competitor.	Branch.	Spur.	Rod.	Total.
A. T. Leske	Williamstown	92	96½	188½
F. Boehm	Light's Pass	93	88½	181½
C. R. Helbig	Light's Pass	88½	92½	181
R. Gallasch	Koonunga	90½	90½	181
J. B. Helbig	Greenock	88	92	180
A. L. Wayman	Penwortham	89	90	179
C. Robertson	Williamstown	91	88	179
C. A. Hoffmann	Lone Pine	89	89	178
A. Obst	Greenock	83	92	175
F. H. Linton	Lyndoch	85½	89	174½
A. Smith	Watervale	89½	84½	174
C. C. T. Vinall	Williamstown	80½	93	173½
H. K. Boehm	Light's Pass	83	90	173
H. Kromer	Lone Pine	83	89½	172½
H. O. Helbig	Greenock	83	89	172
B. Fromm	Lone Pine	85	87	172
G. Merritt	Penwortham	89	83	172
H. Mibus	Koonunga	83	88½	171½
F. Nayda	Penwortham	85	84	169
O. Burford	Watervale	78½	89½	168
S. Ward	Watervale	85	82½	167½
L. Dahlitz	Lyndoch	87	79½	166½
E. Boehm	Lyndoch	83½	78½	161

FRUIT TREE SECTION.

Competitor.	Branch.	Prune.	Pear.	Peach.	Apricot.	Total.
A. Andriske	Lone Pine	92½	92½	90½	93	368½
V. Duke	Penwortham	92½	94	92	89	367½
E. Boehm	Light's Pass	91½	88½	91	94	365
F. Boehm	Light's Pass	87½	92	93	92	364½
G. Boehm	Light's Pass	92½	90	93	88	363½
J. B. Helbig	Greenock	89	93½	93½	86½	362½
D. J. Bain	Williamstown	88½	91	89½	91½	360½
E. Burgess	Watervale	90	86	91	91	358
R. Schultz	Greenock	93	89	87	87½	356½
F. Burgess	Penwortham	88	91	92	85	356
C. F. Wilksch	Greenock	84½	95	89	86½	355
C. A. Hoffmann	Lone Pine	90½	90	90	81	351½
A. D. Bain	Williamstown	90½	89	86½	83½	349½
O. Burford	Watervale	91	87½	89	80½	348
F. Nayda	Penwortham	89½	89½	86½	82	347½
E. Auricht	Lone Pine	91	87½	78	85	341½
A. T. Leske	Williamstown	90½	79½	79½	84	333½

The trophies donated by the Royal Agricultural and Horticultural Society were won by Messrs. A. T. Leske and A. Andriske.

Committee of Lower North Pruning Competitions.

LANGDON PARSONS' TROPHY.

The trophy donated by Mr. W. Langdon Parsons for the Competitor who, in the Local Competitions of 1934, 1935, and 1936 obtains the highest aggregate points in both the Fruit Tree and Vine Sections was won by Mr. J. B. Helbig of Greenock; the scores of the competitors being as follows:—

Competitor.	Branch.	1934.	1935.	1936.	Totals.
J. B. Helbig	Greenock	541½	540½	559	1,641½
C. A. Hoffmann	Lone Pine	543	537½	558	1,638½
G. Boehm	Light's Pass	548	539	550½	1,637½
E. G. Helbig	Greenock	536	543	544	1,623
C. F. Wilksch	Greenock	528	542½	546	1,616½
Fred Boehm	Light's Pass	522½	541½	548½	1,612½
H. Linton	Light's Pass	519	557	529	1,605
A. Andriske	Lone Pine	530½	535	536½	1,602
H. Kappler	Lone Pine	517½	543½	540½	1,601½
S. M. Turnbull	Lone Pine	529½	523½	543½	1,596½
Ern Boehm	Light's Pass	520½	533½	539	1,593
A. T. Leske	Williamstown	525	533½	531	1,589½
Ken Boehm	Light's Pass	517	519	545½	1,581½
W. B. Koop	Light's Pass	509½	541½	519	1,570
W. R. Ahrens	Light's Pass	508	542½	520	1,570½
W. O. Baker	Watervale	531	516	521	1,568
A. Smith	Watervale	518½	518	528½	1,565
A. S. Burgess	Watervale	527½	515½	518½	1,561½
O. Burford	Watervale	527½	497½	532½	1,557½
A. B. Fromm	Lone Pine	516	516	522	1,554
E. Kruger	Light's Pass	502½	529	518½	1,550
F. Nayda	Penwortham	507	508½	533	1,548½
V. M. Duke	Penwortham	507	516½	524	1,547½
Don Boehm	Light's Pass	499	519½	523½	1,542
E. Burgess	Watervale	506½	517	517	1,540½
C. S. Wyman	Penwortham	518	490½	509	1,517½
A. L. Wayman	Penwortham	481½	506½	517½	1,505½

WORMS IN SHEEP.

A reply supplied by the Stock and Brands Department to a correspondent who asks why the administration of various medicaments over a period of years has not been successful in ridding sheep of stomach worms.

Many factors are responsible for failure, such as:—(1) The drenches were not given often enough. (2) No drench is 100 per cent. effective in killing all the worms present, and furthermore, in addition to the adult worms passed, there would be thousands of eggs which, containing the larvae form of the worms, could develop in the soil, and later be picked up by the sheep while grazing, and they would then become re-infested. (3) Introduction on to the farm of sheep purchased at markets, &c. (4) The sheep, in addition to being infested with stomach worms, are most likely infested by minute threadlike worms, which live in the small intestines, and are most difficult to get rid of.

The most successful drench for stomach and intestinal worms is a mixture of Bluestone solution and Black Leaf 40, particulars of which are as follows:—Two different strengths of copper sulphate may be used, viz.:—

No. 1.—Bluestone solution, 2 per cent. strength, *i.e.*, 1lb. dissolved in 6galls. of water, in which is mixed 14 fluid ozs. of "Black Leaf 40" Solution. Dosage: Adult sheep, 2 fluid ozs. (four tablespoons); two tooths, 1½ fluid ozs. (three tablespoons); lambs, 6-12 months old, 1 fluid oz. (two tablespoons); lambs, 3-6 months old, ½ fluid oz. (1 tablespoon).

No. 2.—Bluestone solution, 5 per cent. strength, *i.e.*, bluestone 1lb., "Black Leaf 40" 14 fluid ozs., water 2galls. Dosage: Adult sheep, ¾ fluid oz. (or 20 c.c.'s); two tooths, 4-6 fluid drams (or 15-20 c.c.'s); lambs, 4-15 months, 1½-4 fluid drams (or 5-15 c.c.'s); up to 4 months, 1½ fluid drams (or 5 c.c.'s). Note.—Doses of the 5 per cent. solution vary according to size and weight.

To Prepare Bluestone-"Black Leaf 40" *Solutions.*—Use only the bright blue crystals, discarding any that are white and powdery. Dissolve the crystals in a little boiling water and then add water to make six or two gallons, according to which ever formula you intend using. Then add the "Black Leaf 40" and stir well. As bluestone corrodes metals, it should be prepared in earthenware, porcelain, or wooden vessels.

2 fluid ozs. = 4 tablespoonfuls.
1 fluid oz. = 2 tablespoonfuls.
½ fluid oz. = 1 tablespoonful (or 4 fluid drams).
2 fluid drams = 1 dessertspoonful.
1 fluid dram = 1 teaspoonful.

But it is recommended that a graduated measure glass up to 2 fluid ozs. be used, as the size of spoons is liable to vary.

The main advantage in using a 5 per cent. solution is that the dose is smaller and therefore easier to administer.

1 fluid oz. of 5 per cent. solution contains 22 grains $CuSO_4$.
1 fluid oz. of 5 per cent. solution contains 16 mins. "Black Leaf 40".
1 fluid oz. of 2 per cent. solution contains 8½ grains $CuSO_4$.
1 fluid oz. of 2 per cent. solution contains 6½ mins. "Black Leaf 40".

In using either of these solutions it is not necessary to starve the sheep beforehand. In the case of badly affected sheep, the drench should be repeated in 10 days' time and then every 28 days. If possible, after drenching place them in a paddock, which will not be used for grazing sheep, for 48 hours. By doing this your pastures will not become so heavily infested and thus reduce the chances of a massive re-infestation of sheep. Another point to bear in mind is that sheep introduced on to the farm from markets, &c., should be drenched before they arrive at the farm. In addition to any medicinal treatment, it is essential that sheep have good nutritious food, so that if the grazing is scarce it is necessary to supplement it by feeding concentrated with chaff. Provided the solutions recommended are carefully prepared in accordance with instructions, and the correct dose given, no losses will occur following their use.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. SANDFORD & CO. LIMITED reported on 1st July, 1936:—

BUTTER.—Production throughout June was disappointing as, owing to the lateness of the opening of the season, the feed growth was backward and butter production was about 20 per cent. to 25 per cent. less than for the corresponding period last year. Since then the "lag" has been overtaken somewhat but is still behind 1935 figures. The London market fortunately has not slumped and at the date of report choicest Australian on spot was selling at 105s. per cwt., which compares with 87s. at this time last year. Local prices have continued fairly steady at:—Choicest creamery fresh butter, in bulk, 1s. 3¾d. per lb.; prints and delivery extra. (This price is for local sale only and, under the Quota System, the equalised price manufacturers will receive will be 1s. 2⅜d. per lb., on which basis payments to cream suppliers will be calculated.)

CHEESE.—Milk supplies to the factories are now improving each week, although in this commodity the tonnage produced is less than last year. Good interstate and local trade cleared consignments each week and there is no surplus yet available for the London market. Present prices are:—Large and medium, from 9½d. per lb.; loaf, from 10d. per lb. at store door, delivery extra; semi-matured and matured, 1s. to 1s. 1d. per lb.

EGGS.—It was expected that ere this supplies would have increased rapidly, but the cold weather has checked production and with a strong local and interstate demand the packing floors have been kept cleared. Within the next week or two, however, exporting to London will commence. Values are:—Ordinary country eggs, f.a.q., from 8d. per doz. net; selected new laid, clean eggs, full-sized, to 1s. per doz. net.

BACON.—Steady turnover in bacon took place throughout the month, although the demand for hams, as is usual during the winter, was very slow. The factories forwarded ample supplies, and all requirements were met. Best quality sides, 9½d. per lb.; middles, 9½d. to 10d.; heavy middles, 9d.; rolls, to 8d.; hams, 11d. to 1s.; cooked, 1s. 2d. to 1s. 2½d.; lard, bulk, 6d. to 6½d.; prints, 7d. per lb.

ALMONDS.—Limited supplies met with keen demand, and greater quantities could be placed. We advise consigning. Softshells and Brandis, 8½d. to 9d.; hardshells, 5d. to 5½d.; kernels, 1s. 9½d. to 1s. 10½d. per lb.; walnuts, 9d. to 11d. per lb.

HONEY.—The improved winter demand was maintained throughout the month, and supplies are now moving steadily, that is for prime quality clear extracted. Quotations are:—Prime quality clear extracted, 2d. to 2½d.; lower grades, 1d. to 2d. per lb.

BEESWAX.—Was short in supply, and buyers' requirements were only partially filled. Rates were unaltered, being:—1s. 3d. to 1s. 4d. per lb., according to quality.

LIVE POULTRY.—Auction sales are held every Tuesday, Wednesday, Thursday, and Friday at our sale rooms. The catalogues submitted throughout the month were fairly extensive, but with some purchasers having buying orders from the eastern States, keen competition was experienced, especially for prime quality, well breasted, table birds. We advise consigning. Crates loaned free on application. The following are prices realised:—Prime roosters, 3s. 6d. to 4s. 9d.; nice-conditioned cockerels, 2s. 8d. to 3s 4d.; fair-conditioned cockerels, 2s. to 2s. 9d.; chickens, lower; heavy-weight hens, 2s. 6d. to 3s. 3d.; medium hens, 1s. 9d. to 2s. 4d.; light hens, 1s. 5d. to 1s. 8d; couple of pens of weedy sorts, lower; prime young Muscovy drakes, 3s. 1d. to 3s. 9d.; young Muscovy ducks, 2s. to 2s. 6d.; ordinary ducks, 1s. to 1s. 9d.; ducklings, lower; geese, 2s. 6d. to 3s. 9d.; goslings, lower; turkeys, good to prime condition, 7½d. to 9½d. per lb. live weight; turkeys, fair condition, 6d. to 7d. per lb. live weight; turkeys, poor and crooked-breasted, lower; pigeons, 5d. each.

POTATOES.—New season's, 10s. per cwt.

ONIONS.—Brown Spanish, 10s. 6d. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of June, 1936, and also the average precipitation for June, and the average annual rainfall.

Station.	June, 1936.	Av'ge. for June.	To end June, 1936.	Av'ge. Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta ..	—	0·60	1·63	4·62
Marree	—	0·69	1·43	5·83
Farina	—	0·83	1·87	6·37
Copley	—	1·04	2·45	7·85
Beltana.......	0·08	1·05	3·24	8·47
Blinman	0·23	1·57	2·97	11·81
Hookina	0·34	1·72	4·46	11·18
Hawker	0·27	1·87	3·82	12·2
Wilson	0·48	1·76	5·27	11·77
Gordon	0·42	1·43	3·36	10·46
Quorn	0·93	1·78	3·95	13·15
Port Augusta..	0·77	1·14	4·46	9·40
Bruce	0·85	1·31	6·91	9·74
Hammond	0·68	1·37	4·92	11·11
Wilmington ..	2·02	2·39	8·85	17·28
Willowie	0·83	1·60	4·65	12·22
Melrose	2·61	3·28	10·25	22·85
Booleroo Centre	1·01	2·13	5·10	15·21
Port Germein .	1·02	1·50	4·94	12·53
Wirrabara	1·62	2·67	5·93	19·25
Appila........	1·18	1·77	5·95	14·62
Cradock	0·33	1·54	3·78	10·78
Carrieton	0·76	1·63	4·52	12·19
Johnburg	0·75	1·30	5·06	10·56
Eurelia	0·93	1·65	5·47	12·76
Orroroo.......	1·03	1·75	5·77	13·20
Nackara	0·61	1·37	10·44	11·09
Black Rock ...	0·97	1·55	5·77	12·35
Oodlawirra ...	0·74	1·29	6·45	11·67
Peterborough..	0·98	1·57	5·66	13·22
Yongala	1·35	1·80	7·32	14·43
NORTH-EAST.				
Yunta	0·77	0·96	3·61	8·84
Waukaringa ..	0·67	1·01	3·90	7·89
Mannahill	0·59	0·89	2·73	8·16
Cockburn	0·27	0·93	4·21	7·91
Broken Hill ..	0·18	1·13	3·82	9·50
LOWER NORTH.				
Port Pirie	0·69	1·73	6·00	13·19
Port Broughton	0·55	2·00	3·76	13·85
Bute	0·79	2·25	5·82	15·39
Laura	1·75	2·38	7·48	17·97
Caltowie	1·09	2·04	6·29	16·76
Jamestown....	1·70	2·27	6·89	17·72
Gladstone	1·26	2·05	5·68	16·32
Crystal Brook .	0·88	2·13	5·70	15·76
Georgetown ..	1·29	2·41	6·90	18·29
Narridy	1·04	2·14	4·87	15·77
Redhill	1·21	2·36	7·27	16·54
Spalding	1·10	2·50	6·05	18·74
Gulnare	1·08	2·51	6·68	18·59
Yacka	1·18	2·11	6·10	15·38
Koolunga	1·04	2·10	4·70	15·32
Snowtown	1·41	2·22	7·21	15·70
LOWER NORTH—*continued.*				
Brinkworth	1·28	2·26	4·99	15·73
Blyth	1·37	2·20	6·98	16·73
Clare	2·84	3·35	11·18	24·45
Mintaro	2·69	3·29	9·33	23·36
Watervale	3·56	3·71	11·48	26·74
Auburn	2·85	3·11	10·39	23·96
Hoyleton	2·23	2·21	8·30	17·27
Balaklava.......	1·93	1·90	5·54	15·43
Port Wakefield ..	1·32	1·62	5·62	12·93
Terowie	1·25	1·52	7·95	13·34
Whyte-Yarcowie	1·09	1·64	8·66	13·58
Hallett	1·13	2·12	6·58	16·41
Mount Bryan....	1·27	2·23	7·74	16·77
Kooringa	1·55	2·37	7·59	17·81
Farrell's Flat ...	2·09	2·52	9·25	18·54
WEST OF MURRAY RANGE.				
Manoora	2·06	2·45	7·35	18·94
Saddleworth	2·33	2·48	9·00	19·59
Marrabel........	2·17	2·66	8·44	19·96
Riverton........	2·71	2·72	9·59	20·79
Tarlee	1·74	2·30	7·76	18·09
Stockport	1·90	2·23	7·81	16·97
Hamley Bridge .	1·69	2·24	6·89	16·52
Kapunda	1·63	2·47	7·75	19·76
Freeling	1·54	2·38	6·38	17·79
Greenock	1·50	2·86	7·97	21·47
Truro	1·06	2·69	7·39	19·79
Stockwell	1·17	2·77	7·62	20·04
Nuriootpa	1·77	2·90	8·86	20·68
Angaston	1·36	3·14	9·03	22·32
Tanunda........	1·33	3·18	8·02	21·94
Lyndoch	1·49	3·53	6·37	23·27
Williamstown ...	1·98	4·62	7·87	27·61
ADELAIDE PLAINS.				
Owen	2·63	1·47	8·05	14·64
Mallala	1·76	2·28	6·71	16·49
Roseworthy	1·71	2·42	6·06	17·42
Gawler	1·65	2·58	6·56	18·85
Two Wells	2·32	2·28	6·29	15·76
Virginia	2·24	2·48	7·73	17·20
Smithfield	1·99	2·55	6·34	17·65
Salisbury	1·46	2·73	5·20	18·56
Adelaide	2·27	3·09	7·74	21·14
Glen Osmond....	2·76	4·20	8·98	25·97
Magill	2·59	3·98	7·94	25·37
MOUNT LOFTY RANGES.				
Teatree Gully ...	2·18	4·37	7·35	27·07
Stirling West ...	5·64	7·94	15·57	46·95
Uraidla	5·36	7·40	12·34	43·95
Clarendon.......	4·23	5·18	11·84	32·79
Happy Val'y Res.	2·62	—	9·01	—
Morphett Vale ..	2·51	3·38	7·46	22·59
Noarlunga	3·12	3·12	8·72	20·33
Willunga	3·45	3·93	8·13	25·97
Aldinga.........	2·53	3·20	7·48	20·21

RAINFALL—*continued.*

Station.	June, 1936.	Av'ge. for June,	To end June, 1936.	Av'ge. Annual Rainfall.
MOUNT LOFTY RANGES—*continued.*				
Myponga	4·69	4·66	10·10	29·42
Inman Valley .	5·68	—	10·86	—
Yankalilla	3·31	3·76	7·13	22·76
Mount Compass	5·36	—	12·09	—
Mount Pleasant	2·54	4·19	11·17	27·11
Birdwood	2·46	4·65	9·20	29·07
Gumeracha ...	2·75	5·30	8·64	33·31
Millbrook Res..	3·01	5·17	9·10	34·47
Lobethal	3·99	6·04	10·87	35·91
Woodside	3·34	5·18	9·76	32·15
Hahndorf	4·26	5·53	10·73	34·77
Nairne	2·61	4·15	10·45	28·12
Mount Barker	2·97	4·50	9·95	31·24
Echunga	4·45	5·19	12·64	33·25
Macclesfield ..	3·51	4·41	12·47	30·34
Meadows	4·48	5·46	13·06	36·02
Strathalbyn ..	2·05	2·50	9·90	19·32
MURRAY FLATS AND VALLEY				
Meningie......	1·85	2·64	7·81	18·31
Milang	1·76	2·11	7·68	14·89
Langhorne's Ck	1·60	1·91	8·53	14·91
Wellington ...	1·42	1·90	8·08	14·65
Tailem Bend ..	1·53	1·78	9·05	15·06
Murray Bridge	1·06	1·64	7·98	13·51
Callington	1·64	1·95	7·37	15·15
Mannum	0·73	1·37	5·68	11·48
Palmer	1·39	1·93	8·44	15·59
Sedan	0·46	1·58	4·57	12·05
Swan Reach...	0·39	1·22	5·07	10·65
Blanchetown ..	0·23	1·19	5·69	11·01
Eudunda	1·35	2·24	8·34	17·15
Point Pass ...	1·67	1·77	8·48	16·72
Sutherlands ..	0·48	1·38	5·73	10·81
Morgan	0·56	0·99	4·43	9·16
Waikerie......	0·42	1·15	6·62	9·66
Overland Corner	0·58	1·12	6·22	10·25
Loxton	0·61	1·21	5·50	11·50
Berri	0·56	1·06	5·86	10·13
Renmark	0·49	1·11	6·38	10·38
WEST OF SPENCER'S GULF.				
Eucla	1·20	1·13	2·86	10·02
Nullarbor	1·17	1·37	2·26	8·85
Fowler's Bay .	2·08	2·18	4·94	11·19
Penong	1·73	1·91	4·67	12·22
Koonibba	1·30	1·78	3·60	12·09
Denial Bay ...	2·10	1·75	4·21	11·19
Ceduna	1·39	1·55	3·64	10·21
Smoky Bay ...	1·57	1·79	3·19	10·42
Wirrulla	1·57	1·71	2·93	10·51
Streaky Bay ..	1·51	2·83	3·26	14·85
Chandada	0·99	1·75	2·16	12·42
Minnipa	1·22	2·20	3·23	13·91
Kyancutta ...	1·41	1·67	3·45	12·77
Talia	1·39	2·70	2·62	14·76
Port Elliston .	1·56	3·24	3·72	16·51
Lock	1·78	2·47	4·46	16·34
Mount Hope ..	1·71	—	4·00	—
Yeelanna	1·51	2·50	3·33	15·94
Cummins	2·34	2·94	4·17	17·58
Port Lincoln..	1·96	3·17	5·55	19·37
Tumby	1·55	1·87	3·78	14·25
Ungarra	1·55	2·38	4·55	16·87
Port Neil	1·01	1·75	3·51	13·11
WEST OF SPENCERS GULF—*continued.*				
Arno Bay	1·36	1·60	3·43	12·71
Rudall	1·22	1·48	3·89	12·98
Cleve	1·51	1·93	5·24	14·88
Cowell	1·51	1·27	5·61	11·07
Miltalie	1·75	1·68	5·32	13·70
Mangalo	1·37	1·74	7·58	13·86
Darke's Peak ...	1·45	2·20	4·91	15·08
Kimba	1·06	1·47	2·59	11·68
YORKE PENINSULA.				
Wallaroo	0·61	2·07	4·80	13·97
Kadina	0·81	2·25	4·90	15·60
Moonta	1·05	2·20	4·33	15·06
Paskeville.......	1·26	2·31	8·79	15·47
Maitland........	2·29	3·02	5·82	19·85
Ardrossan.......	1·63	2·01	4·36	13·95
Port Victoria ...	1·85	2·29	4·02	15·41
Curramulka	2·53	2·74	5·51	17·81
Minlaton........	2·16	2·78	5·47	17·74
Port Vincent ...	1·76	2·29	4·42	14·38
Brentwood	2·23	2·32	3·84	15·54
Stansbury	2·41	2·47	4·97	16·81
Warooka	2·28	2·68	4·61	17·44
Yorketown	2·09	2·59	4·37	16·83
Edithburgh	1·59	2·37	4·06	16·37
SOUTH AND SOUTH-EAST.				
Cape Borda	2·70	4·58	8·52	24·80
Kingscote	2·64	2·99	5·89	19·16
Penneshaw	3·70	2·73	6·70	19·00
Victor Harbour .	3·30	3·17	8·94	21·40
Port Elliot	3·17	2·82	9·73	19·94
Goolwa	2·56	2·43	9·26	17·86
Maggea	0·78	1·12	6·99	10·20
Copeville	0·91	1·37	8·29	11·53
Claypans	0·85	1·02	7·06	10·42
Meribah	0·77	1·16	6·51	11·32
Alawoona	0·61	1·23	6·59	10·40
Caliph	0·93	1·06	6·00	10·98
Mindarie	0·81	1·44	6·15	12·23
Sandalwood	0·98	1·71	7·88	13·64
Karoonda	1·20	1·69	7·24	14·17
Pinnaroo	0·82	1·65	6·72	14·36
Parilla..........	0·98	1·69	7·07	13·72
Lameroo	1·04	1·92	7·07	15·87
Parrakie	1·30	1·68	6·62	14·56
Geranium	1·42	1·90	6·82	16·36
Peake	1·33	1·89	6·49	15·93
Cooke's Plains ..	1·54	2·02	8·39	15·28
Coomandook	1·65	2·24	7·25	17·03
Coonalpyn	2·53	2·31	7·41	17·61
Tintinara	2·81	2·46	7·88	18·62
Keith	2·19	2·19	7·00	17·93
Bordertown	2·07	2·53	6·13	19·14
Wolseley........	2·19	2·38	5·90	18·47
Frances.........	3·11	2·50	7·03	20·08
Naracoorte	3·58	3·20	7·11	22·63
Penola	4·14	3·51	7·26	25·96
Lucindale	2·67	3·47	9·35	23·38
Kingston	3·90	3·88	10·38	24·24
Robe	4·61	4·01	9·66	24·64
Beachport	5·74	4·62	11·00	27·06
Millicent	5·89	4·59	12·15	29·83
Kalangadoo	5·70	4·08	10·72	32·20
Mount Gambier.	4·60	3·97	9·79	30·37

AGRICULTURAL BUREAU REPORTS.

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		Aug.	Sept.
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	1529	28	—
Alma	*	—	—
Angaston	*	—	—
Appila-Yarrowie	1529	7	4
Arthurton	*	—	—
Ashbourne	*	26	—
Auburn Women's	1544	28	—
Balaklava	*	—	—
Balhannah	*	—	—
Balhannah Women's	1544	—	—
Balumbah	*	—	1
Balumbah Women's	—	5	2
Barmera	*	—	—
Baroota	*	10	14
Beetaloo Valley	1529	3 & 31	—
Beetaloo Valley Women's	1544	—	—
Belalie Women's	1544	11	8
Belvidere	*	—	—
Berri	—	3 & 31	—
Blackheath	*	6	3
Black Rock	*	—	—
Black Springs	1529	—	1 & 29
Blackwood	*	10	14
Block E	*	—	—
Blyth	*	28	25
Booborowie	1529	3 & 31	—
Booleroo Centre	*	28	25
Boolgun	*	—	—
Boor's Plains	1530	6	3
Boor's Plains Women's	1544	6	3
Brentwood	*	3	7
Brimpton Lake	1530	—	—
Brinkley	*	5 & 26	—
Brownlow	1529	—	—
Buchanan	*	—	—
Bundaleer Springs	*	—	—
Bute	*	20	17
Butler	1530	—	—
Calca	*	—	—
Caliph	*	4	1
Cambrai	1529	—	—
Carey's Gully	*	10	14
Chandada	*	—	—
Chapman's Bore	1530	3 & 31	—
Cherry Gardens	*	—	—
Chilpuddie Rock	*	—	—
Clare Women's	1544	1	5
Clarendon	*	3 & 31	—
Collie	*	5 & 26	—
Coomandook	—	28	25
Coonalpyn	1530	—	—
Coonalpyn Women's	1544	—	—
Coonawarra	*	6	—
Coonawarra Women's	1544	19	16
Cummins	*	14	11
Cungena	1530	6	3
Currency Creek	*	3 & 31	—
Devlin's Pound	1530	—	—
Devlin's Pound Women's	*	5	2
Dudley	*	—	—
Echunga	*	12	9
Echunga Women's	1544	5	—
Eurelia	*	8	12
Eurelia Women's	*	5	2
Finniss	*	—	—
Frayville	*	—	—
Gawler River	*	—	—
Georgetown Women's	1544	11	8
Gladstone	*	28	—
Gladstone Women's	*	14	11
Goode	1530	—	—
Goode Women's	*	—	—
Green Patch	*	27	—
Greenock	*	—	—
Gumeracha	1530	3 & 31	—
Hanson	*	—	1
Hartley	1530	26	—
Hilltown	1529	4	1
Hindmarsh Island	*	—	—
Hope Forest	*	3	7
Hope Forest Women's	1544	—	—
Inman Valley	1530	20	17
Iron Bank	1530	—	—
Jamestown	*	24	15
Jervois	1530	13	10
Kalangadoo	*	8	12
Kalangadoo Women's	*	8	12
Kangarilla Women's	*	20	17
Kanni	*	—	—
Karte	1530	5	2
Karte Women's	1544	5	2
Kelly	1530	1	5
Ki Ki	*	—	—
Kilkerran	*	3 & 31	28
Koolunga	*	—	—
Koolunga Women's	*	—	—
Koonunga	1529	—	—
Koppio	1530	5	2
Kulkawirra	—	11	8
Kyancutta	1530	4	1
Kybybolite	1529	27	—
Kybybolite Women's	1544	—	—
Lameroo	*	1 & 29	—
Laura	*	26	5
Laura Bay	1530	11	8
Laura Bay Women's	*	—	—
Lenswood and Forest Range	*	—	—
Light's Pass	1529	—	—
Lipson	*	1 & 29	—
Lobethal	*	20	17
Lobethal Women's	*	17	21
Lone Gum and Monash	*	20	17
Lone Pine	*	3 & 31	—
Longwood	*	—	—
Lyndoch	1529	4	1
MacGillivray	*	4	1
McLaren Flat	*	—	—
McLaren Flat Women's	1544	6	3
Maltee	*	6 & 27	—
Maltee Women's	1544	—	—
Mangalo	*	—	—
Mangalo Women's	1544	12	9
Marama	1530	—	—
Meadows	1530	—	—
Milang	*	8	12
Millicent	1529	26	25
Millicent Women's	1544	—	—
Miltalie	*	1 & 29	—
Minnipa	*	—	—
Monarto South	*	—	—
Monarto South Women's	1544	15	19
Moorlands	*	5	2
Moorook	*	—	—
Morchard	*	28	—
Morchard Women's	*	26	23
Mount Barker	*	17	21
Mount Bryan	1529	—	—
Mount Compass	*	6	3
Mount Gambier	*	14	11
Mount Hope	*	—	1
Mount Pleasant	*	5	26

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.	
		Aug.	Sept.
Mudamuckla	*	8	12
Mudamuckla Women's	*	19	16
Mundalla	*	—	—
Mundalla Women's	*	6	8
Murray Bridge	*	—	—
Murraytown	1529	—	—
Mypolonga	*	—	—
Myponga	*	20	17
Myponga Women's	1544	6	8
Nantawarra	1529	27	—
Narridy	1529	—	—
Narridy Women's	1544	—	—
Narrung	*	—	—
Nelshaby	*	—	—
Nelshaby Women's	*	—	—
Nunjikompita	1530	27	—
Nunkeri	*	27	—
O'Loughlin	*	10	14
O'Loughlin Women's	1544	—	—
Owen	*	10	14
Owen Women's	1544	11	R
Palabie	1530	—	—
Parilla	*	18	15
Parilla Women's	1544	19	15
Parilla Well	*	3 & 31	—
Parilla Well Women's	*	25	29
Parrakie	*	—	—
Parrakie Women's	*	26	29
Paskeville	1530	—	1
Penola	*	1	5
Penola Women's	1544	—	—
Penwortham	*	5 & 26	—
Petina	*	22	26
Pinbong	*	22	19
Pinbong Women's	1544	22	19
Pinkawillinnie	*	—	—
Pinnaroo	1530	—	—
Pinnaroo Women's	1544	7	4
Port Elliot	*	—	—
Pygery	*	—	1
Pygery Women's	1544	4	8
Ramco	1530	3 & 31	—
Redhill	1529	—	—
Rendelsham	1544	6 & 27	—
Rendelsham Women's	—	—	—
Renmark	*	—	—
Riverton	*	10	14
Roberts and Verran	*	—	—
Rosedale	1529	—	—
Roseworthy	*	—	—
Saddleworth	*	—	4
Saddleworth Women's	1544	4	1
Scott's Bottom	*	1 & 29	—
Sheoak Log Women's	1544	13	10

Branch.	Report on Page.	Dates of Meetings.	
		Aug.	Sept.
Shoal Bay	*	—	1
Snowtown	*	14	11
Snowtown Women's	1944	6	3
South Kilkerran	1530	8	7
Springton	1530	5	2
Stanley Flat	*	17	21
Stockport	*	—	—
Strathalbyn	*	12	9
Strathalbyn Women's	1544	9	10
Sutherlands	1529	6	3
Tantanoola	1529	1	5
Tantanoola Women's	1544	5	2
Taplan	*	—	1
Taplan Women's	*	—	—
Taragoro	1530	27	—
Tarlee	*	—	—
Tatiara	*	—	—
Truro	1529	17	21
Ungarra	*	—	—
Upper Wakefield	1529	27	24
Waikerie	*	—	—
Wallala	1530	8	12
Wandearah	1529	4	29
Warcowie	1529	—	1
Warcowie Women's	1544	—	—
Warramboo	1530	—	1
Warramboo Women's	1544	—	—
Wasleys	*	6	8
Wasleys Women's	—	6	3
Watervale	*	17	21
Weavers	1530	10	14
Wepowie	*	3	7
Wepowie Women's	*	—	—
Whitwarta	*	17	21
Wilkawatt Women's	*	18	15
Williamstown	*	—	—
Williamstown Women's	1544	5	2
Willowie	*	24	28
Wilmington	1529	18	21
Wilmington Women's	1544	—	—
Wirrabara	*	—	—
Wirrabara Women's	1544	20	—
Wirrilla	*	1 & 29	—
Wirrilla Women's	*	8	3
Wolseley	1529	10	14
Wudinna	*	—	—
Yadnarie	*	—	1
Yandiah	*	14	11
Yandiah Women's	1544	14	11
Yeelanna	*	—	2
Younghusband	*	—	—
Yundi	1530	—	—
Yurgo	*	—	—
Yurgo Women's	*	—	—

* No report received during the month of June. R In recess.

If dates do not appear above, Secretaries are requested to advise the General Secretary of details of Branch programmes, or of the regular night of meeting, *e.g.* 3rd Monday in month.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[The new Bureau subscription rate of 2s. per annum, which was recommended at the 1933 Congress, applies to all members as from 1st August, 1934, with the following exceptions:—Life members, Branch Secretaries, and members who reside in the same house as (a) a Life Member, or (b) a Branch Secretary, or (c) a subscribing member. Subject to the foregoing exceptions, new members joining during the months of July to December will pay 2s. per annum, and those joining during the months of January to June 1s. for that period and 2s. for each succeeding year. Subscriptions must accompany the nomination forms unless the nominee is exempt.]

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

MEN'S BRANCHES.

POULTRY AS A SIDELINE.

[Paper read by Mr. E. W. Wilson at a meeting of the Whitwarta Branch on 4th April, 1936.]

Poultry keeping has been practised for many years. In Gent's "*Systema Agriculturae,*" published in 1675, the keeping of fowls for profit is advocated, and advice given as to management; but it contains no description of different breeds.

From a State point of view it is generally accepted that there are possibilities for further extension of poultry raising on farms where climatic conditions are very suited to the production and marketing of a perishable product such as eggs. This paper is written from the point of view of poultry kept as a sideline to general farming, not as a sole means of livelihood, as it appears that, to a large extent, the greater extension of the industry from an egg producing aspect will come from the farming areas.

In the last few years a marked expansion has taken place in the rearing and keeping of large numbers of poultry in the suburban areas. No doubt, this can be attributed to the depression and people with a block of land or two are keeping poultry in order to obtain some return. The average farmer has an advantage over the suburban producer in production costs. The land necessary for the keeping of poultry is available on the average farm; the cost of feeding is also reduced to the minimum, as practically all the food materials necessary for the production of eggs are grown on the farm. This is a distinct advantage, as the suburban man has to buy most of the necessary foodstuffs. In districts where water supplies are available and are suitable for the growing of green fodders, there is no reason why eggs of the highest quality cannot be produced on the average farm.

There is another important item regarding poultry raising, and that is the employment of the younger generation on the farm, which is worrying most of the parents at present. I believe that where boys and girls show any inclination towards the care of poultry, they should be given an opportunity of improving their knowledge. The Education Department is doing good work in this matter under the Home Project Clubs. In the Egg Laying Competition conducted at Parafield Poultry Station, there is a section for Home Project Workers, in which a number of boys from all parts of the State have birds competing, and some of the birds are recording wonderful results.

Producing eggs and marketing them continually in a haphazard way is only courting disaster. To argue that it requires special skill to produce eggs of the quality desired cannot be substantiated. Only about three years ago the settlers on the Land Settlement Scheme, under the control of the Employment Promotion Council, received their first supply of poultry, and it should be remembered that very few of these settlers had any previous experience with poultry. During the last 12 months nearly 100 per cent. of the eggs produced by these settlers have passed the grading for export. There are no statistics available concerning the average consumption of eggs in this State. If the annual consumption of eggs were only increased by a dozen per head, the increase would be equal to some 580,000 dozen and this should be easily attained if the public were assured of buying eggs which were not only attractive in condition of the shell, but of good quality.

In considering the question of keeping poultry on a farm, the principal point to be considered is the extent to which a side line can be handled on the farm without interfering with the more important work of the holding. Generally speaking it is the womenfolk who give most attention to the poultry on the farm and this fact counteracts the belief that the keeping of poultry on the farm is more or less a drag on the farmer himself. The principal question is marketing. In order to obtain best results the eggs should be marketed twice a week in the summer months. In order to make this economically possible sufficient birds should be kept so that a case of eggs can be marketed at a time, and from 300 to 350 fowls should be kept. To ensure a regular supply of eggs it will be necessary to replace a certain percentage of the flock each year. I would suggest that if 300 fowls are kept, 30 per cent. should be replaced each year. It is doubtful whether any bird after three laying seasons is worth keeping for the production of eggs only. On the majority of farms one often hears that during the months of April and May, there is a shortage of eggs. This is due to the fact that the old stock are moulting and no young ones have been reared to take their place. Until producers realise that pullets are the only class of stock that will lay any number of eggs during the winter months, a shortage of eggs will regularly occur.

Thousands of birds on farms to-day are only laying a few eggs a year. A good method of building up one's stock is to watch the flock well and cull out all the old and defective birds.

The first laying season of a hen is the most profitable one. In the second year the birds that have been proved the best layers during the first season should be used as breeders, and a portion of only the very best layers retained for the third season. No birds should be kept after the third season unless as breeders. There are numerous breeders of high-class poultry in the State, and I would suggest replacing each year a certain amount of your flocks with these, either by fertile eggs (if one possesses the necessary incubators and brooders), or by day-old chicks.

The question of breed is one that rests entirely with the farmer. Whether a farmer is going to devote his time to egg production alone or to breeding for dual purposes should also be considered. However, the capabilities of the White Leghorns and Black Minorcas as prolific layers are well known. Whatever breed is decided on, it should be the aim to raise stock that will produce 2oz. eggs, as this will be the means of keeping the stock up to a good standard. As the size of the bird deteriorates so does the size of the egg, as well as the general constitution of the bird, making the hatching and rearing more difficult.

Fowls should be always well housed in good, dry sheds, kept free from tick or lice with used crank-case oil or similar substances, and always fed in a systematic method on good wholesome feed, with plenty of good fresh water with a little iodine added to it.

BREEDING AND FEEDING PIGS ON THE FARM AS A SIDELINE.

Paper read by Mr. O. Jaeschke at a meeting of the Wirrabara Branch on 29th February. Pig breeding is one of the most profitable sidelines on a farm. One cannot expect great success without a little dairy on the farm, because skim milk plays an important part in the rearing of pigs. Therefore, the more cows are kept and the more milk there is the greater the profits. Three or four sows could be kept quite easily, and at the same time be well fed. For breeding, a large White Boar mated with Berkshire-Large White cross sows would produce a pig which would be very useful for home consumption, and for which a ready sale would be found at the Abattoirs market. When selecting a young boar for breeding, he should be the biggest and best shaped pig in the litter. He should have 14 teats evenly set and well spaced. The same thing also applies when selecting a young sow, and it is very important that she should have plenty of room between the forequarters and hindquarters. If intending to rear young pigs for breeding they should be well fed and allowed plenty of exercise. Care should be taken not to let a sow become too fat after she has been mated, especially shortly before farrowing. A sow that is too fat would have trouble at farrowing, and after farrowing would be awkward and sluggish, and consequently youngsters are often stepped on and lain on. Pigs do quite well on soaked chaff and a little grain. After a sow has farrowed her grain ration could be gradually increased. Oats, barley, wheat, and also peas are all very good; wheat being the best. All grain fed to pigs should be crushed, as they thrive better on it and it is more easily digested. Care must be taken not to give a sow long straw before or after farrowing, because the young ones often crawl underneath it and the sow lies on them, with the result that they are usually squashed and suffocated. The afterbirth should be removed as soon as possible from the sty in order to prevent the sow from eating it, which she is at times inclined to do. When the youngsters are seven weeks old the bigger ones can be taken away and fed on skim milk mixed with a little crushed wheat. About a week later the others can also be taken away and the sow again mated. As the youngsters grow bigger they can be given more crushed wheat. About a fortnight before marketing they should be given a much as they can consume. A very important food in a pig's diet is meat meal. This could be obtained by killing old ewes which are too old for any other use and boiling the meat down to a soup, which could then be fed with any grain or daily ration. Greenfeed, such as barley, wheat, &c., is a very valuable feed, especially for a sow with a litter. If pigs cannot be grazed on it, it should be cut and fed to them.

SCRUB CLEARING.

In a paper read at a meeting of the Laura Bay Branch on 11th February, Mr. M. Lowe stated that the tillage implements in use by the early settlers of South Australia necessitated the removal of all obstructions from land that was to be cropped. All trees had either to be grubbed out or ringbarked and burnt so that no stump was left. Clearing was a very slow process, as there were no grubbing machines such as are obtainable to-day. As time went on farm machinery was greatly improved, the most notable feature being the invention of the stump-jump plough. Settlers then conceived the idea of cutting trees level with the ground, and the method, known as "Mullenizing" quickly spread, because it did not materially reduce the yields, and large areas could be quickly converted to cereal growing. Settlers progressing into the lighter rainfall areas of the State discovered that the scrub, which consisted mostly of light types of mallee and titree with a few other small trees and bushes, could easily be broken down by a roller drawn by horses, bullocks, or donkeys. It was then burnt and the snags cut off. The rollers were made mostly from discarded steam boilers with a heavy framework of wood mounted on them in order to give the larger trees a lean forward, enabling the roller to travel over them and crush them. Owing to the weight that must be lifted in travelling over heavy timber, beams extending about 2ft. 6in. on each side of the roller to break down larger trees without the roller going over them, saved a great deal of power, thus lowering costs.

Teams were not a great success in the heavier types of rolling scrub. Much time had to be expended in clearing ways for them to get through, and injuries to the animals were often met with. When crawler tractors were introduced they were quickly adapted to scrub rolling, their more vital places being protected with steel plates and screens. Their ability to force their way through almost anything, together with their compactness and great power, made them most suitable for the work. The writer had used such a machine very successfully during the past year. The cost of rolling varied considerably with the type of fuel used and the type of scrub. A tractor using kerosene averaged ½gall. of fuel per acre, and 1gall. of oil per 25 acres. Owing to its initial cost, a tractor and roller would not be a paying proposition on small areas, unless the tractor could also be used for other work. For small areas of light scrub cutting seemed to be the best means of clearing, while for very heavy mallee and titree, patches of which were often met with in the district, a grubbing machine of the Trewhella type was very useful. It would remove the big stumps which did so much damage to farm implements, and which at times remained in the ground for 30 or 40 years; while the soil often drifted from around them, making it necessary to continually burn them down.

POWER FARMING.

Paper read by Mr. E. T. Sinclair at a meeting of the Wandearah Branch held on 5th May, 1936:—No man should go in for a tractor without first taking into consideration his own local conditions. After satisfying himself that a tractor would be a better proposition he must consider the following points:—(1) The best make of tractor to buy. (2) Its suitability to do the work for which it is intended. (3) Service.

My first adventure into power farming was in 1925, when I purchased a 10/20 McCormick Deering tractor, but I found for general purposes that a larger one was required to do my work, so I traded it in for a 15/30 of the same make. In 1927 I sold this tractor and let my farm for a period of four years and resumed farming operations on my own account in 1931, when I purchased a team of horses. I worked the farm with horses for two years and then sold them and bought a second hand 15/30 McCormick Deering tractor which had been in commission for four years. Tractors will not displace horses on all farms, as it is not possible to work some farms with a tractor, but where one will work satisfactorily it is an economic proposition. The cost of fuel per acre on my land is as follows:—ploughing 1s., cultivating 6d., harrowing 2d., and harvesting 9d. Oil has not been taken into account in this summary but costs me approximately £20 a year in the working of 300 acres. During the two years I have been working this tractor £5 would more than cover cost of repairs. The direct expenditure involved in fallowing, working, sowing and harvesting the 300 acres with the tractor was covered by £90 for each of the two previous years.

A lot has been said in favour of horses because the feed necessary for them can be grown on the farm, but I am satisfied that on an average I can grow 6 to 7 bags of wheat to a ton of hay, which makes my estimate of the value of the hay about £3 a ton. Where a tractor is used in place of horses, more stock can be carried on the farm, and of these I prefer sheep. The profits from additional stock contribute largely to the running costs of the tractor. No matter how much the types of horses have been improved, a horse is no stronger to-day than a similar horse was 20 years ago; whereas the present-day tractors are designed so that they will give much greater efficiency and economy than those of even ten years ago. Modern science has also made popular the use of the Diesel engine and charcoal gas among power farmers. The use of pneumatic tyres is also a contributing factor to greater economy and efficiency in farm tractors.

TIMBERING A WELL.

In a paper read at a meeting of the Warcowie Branch on 5th May, Mr. W. A. Crossman stated in timbering a new well the measurements for the timber should be taken accurately. In the case of a well measuring 6ft. x 4ft. to be timbered with split pine or sawn timber averaging 4 or 5 inches, and where the earth walls could be dressed with a pick, the timber should be 3 or 4 inches shorter each side than the dimensions of the walls, *i.e.*, 5ft. 6in. by 3ft. 6in. As each set of timber was erected the earth picked from the walls above could fall in behind the timbers. In that way very little filling, if any, would be required behind the timbers. The best tree for timbering was one that would fill about 9 or 10 inches when split and trimmed. In cutting out timber it was important to joggle out the two ends just half-way the width of the timber, and get ends and sides as near as possible to the same size. One large end of the end-piece should be placed to take the large end of the side-piece. The next tier should be reversed, with the small end of the end-piece on the large end of the bottom tier. By that method the timber would rise fairly level all round. Before timbering an old well it should be tested by lowering a lighted candle into it. If the candle would not burn, the well was not safe for a man to descend. Foul air could be removed from a well either by showering water down it, by plunging a heap of old bagging down quickly, or by means of a wind sail. A stage, consisting of a rope at each corner of the well suspended at the top and supporting a stage made to fit just inside the timbers, could be let down or up as required, thus preventing a lot of earth falling to the bottom of the well. If a well was rotten or likely to be dangerous it was not advisable to go very deep before putting in bearers. When timbering with pine, well-seasoned timbers should be used.

POULTRY ON THE FARM.

[Paper read by Mr. W. BURBIDGE, at a meeting of the Chapman's Boro Branch, on 8th June, 1936.]

The first thing that is necessary for poultry keeping is a good shed. It need not be an expensive one, but must be dry and free from draughts. Some good posts with a straw roof and iron walls (or even white-washed bags) make a fairly good and cheap wall. The roosts should not touch the side of the shed and should all be on the level, not slanting one above the other. Four posts should be put in the ground about 3ft. high, two good rails fastened to the posts, and all perches placed from one rail to the other, and fastened so that they can be easily removed for cleaning purposes. If all perches are oiled at least once a month in the winter and every fortnight in the summer, with a mixture of waste oil and kerosene, one will never have tick or lice, and will seldom have "scaly legs." The shed should face north-east if possible and have a wire-netting front or a netted yard 6ft. high.

Breed of Fowls.—If for eggs only, the White Leghorn stands on its own. If a dual purpose breed is required the utility Black Orpingtons are as good as any. Some of the newer breeds such as Minorca, Brown Leghorns, Rhode Island Reds, Barnevelders, and Welsummers, are good layers—that is, the utility strains, not show strains.)

For breeding, pick late moulters. They are always the best layers. Do not breed from hens under two years old. If one has some good hens, they are not too old until they stop laying. The male should be over 12 months old—18 months is the best age. For the light breeds mate from 18 to 20 hens to a rooster, and with heavy breeds from 12 to 15 hens per male; that is, on the free range. If shut up, have considerably less hens to each male.

Eggs that have wrinkles, that are misshapen in any way, or that are under 2ozs. should not be used for hatching. Have the roosters with the hens in the breeding season only; guaranteed infertile eggs keep longer and sell at a higher value. The best time to hatch chickens is from June to September for heavy breeds, and July to October for light breeds. Always set hens on the ground if possible. Make a hole in the shape of a saucer, and line it with soft grass or straw. When the eggs are due to hatch do not disturb the hen, and do not feed chickens until they are four hours old. The first feed should be dry bran sprinkled around; and after that cracked wheat until 6 or 8 weeks old; then feed ground wheat and bran (mixed with milk if possible). I say use ground wheat as that is grown on the farm and is equal to pollard, and cheaper. Rabbits are good feed for fowls if boiled and mixed in the mash. Fowls need plenty of shade in the summer and shelter from the cold winds in the winter.

A FARMER'S IDEAL POULTRY FARM.

[Paper read by Mr. W. J. Brook at a meeting of the Hartley Branch on 3rd June.]

Egg producing is the one activity that pays for itself on farms at the present time. No matter what other business a farmer has to attend to, he is able to keep a certain number of poultry, because they do not take much time out of each day to look after them and they will repay him doubly for his trouble.

Housing.—Before one can go into poultry-keeping to any extent at all, one must consider housing. Firstly, choose a suitable piece of ground, preferably on the slope of a hill, hard ground (not sand), as this type of soil makes cleaning of the houses easier. The best for lasting is an iron structure 36ft. long by 10ft. wide; this is ample room for 500 birds. The shed should face the east and should be netted in front with 2in. netting, with a door in one corner. Build the roof sloping with the ground, but have the ground so that the water does not lodge at the back of the shed, as this will rust the iron. The best is to trench the ground and bank it up the iron about a foot. A shed 7ft. 6in. at back and 6ft. 6in. in front provides plenty of room for the farmer to work. Suspend the perches from the roof in such a fashion that the tick or lice cannot travel up and down during the night-time. Do not have perches too close to the iron, for if a fowl lays an egg in the back of the shed it is hard to get if one has to scramble over the perches. About 3ft. from the ground is high enough for the birds to perch. One end of the shed should be divisioned off for breeding pens. Have as large a run as possible, for there is no better feed than green grass, and more eggs are obtained by letting the poultry run about.

Breeding.—The next thing a poultry keeper has to do is to select his stock. One must procure the best to get the best. Go to a good reliable breeder and buy a pen of, say, 20 hens (second year) and 2 roosters, preferably White Leghorns for egg production. The outlay may amount to a large sum, but their stock will soon be showing a substantial profit. Get some one (or better still buy a small incubator of 60-egg capacity) to incubate the fertile eggs, and select only those above 2¼ozs. in weight. In 2 or 3 years one should have sufficient numbers to sell, and the best way then is to get rid of the 20 hens one started with and use the first year pullets for breeding, thus keeping the flock young. Sell half every year afterwards (keep a few specially good ones back for breeding), and so keep up the quality of the flock. The roosters have an important part to play in so much that one bad one will spoil a year's work, and it may take several years to get back to where you started. Be careful with mating, as future results depend largely on the class of chick that is reared. The best chick is the August and September hatch.

Feeding.—Give the flock a wet mash in the morning, wheat both mid-day and evening, and keep plenty of clean water available. Give the chicks dry bran for first week, whole wheat second, and then feed the same as the older birds. Keep the chicks in a brooder until they are 2 months old, at which age they will look after themselves. Some people ration their birds, but I believe in giving them as much as they require.

Disease.—At some time or other, especially if the run is over-stocked, diseases and death will worry the farmer, as, generally speaking, he is not a veterinary surgeon and does not know what is wrong. My experience is that if a bird gets past a certain stage (*i.e.*, if they are sitting about and not feeding) it is best to cut off their heads. Some say that is wasteful, and try to cure them, but to give the right medicine at the right time for the right disease is more than most people can do. Perhaps by keeping that bird closed in with the others you are spreading some disease, and may ultimately lose most of the flock, whereas by killing one bird you may check that disease. Roup is one of those bad diseases that requires careful treatment. In all diseases prevention is better than cure. Generally speaking, if a bird is cured of roup she will spread the germs later on through the flock, and once it gets a good hold it is difficult to control. Once or twice a week the farmer should examine his flock as he lets them out in the morning, and see if each individual bird is looking quite healthy. If he detects anything at all the bird should be caught and shut up for close observation. By so doing one can soon learn by appearance what is wrong and treat it accordingly.

I do not agree with keeping poultry shut up the whole time. One may get more eggs, but the time taken in looking after them and the toll of disease more than absorbs the extra number of eggs and leaves the farmer worse off. There are a number of foods on the market, and these may be used to advantage for the closed-in bird, but they are unnecessary for birds that are running out.

One point to remember to help make poultry-keeping a success is to have plenty of good water in the summer time. This can be done by having a tank close handy and pipes laid underground to cement troughs. Do not run heavy and light breeds together, as they require quite different methods and the two do not thrive together. One, a lighter bird than the other, will eat more quickly, so the slow eater does not get as much food as is necessary, and they don't seem to agree, the light bird having the advantage in every way.

ECONOMICAL FEEDING FOR EGG PRODUCTION.

In a paper read before a meeting of the Meadows Branch on 2nd June, Mr. S. Eyles of Clarendon stated:—

I have been feeding sprouted wheat for over three years now. This is economy, because 1¾ozs. is ample instead of the usual 2ozs. (all weights mentioned are dry weights), so that there is a saving of 1bush. in every 8bush. For each 100 fowls allow 8½lbs. of wheat per feed; that is, 17lbs. of wheat per 100 fowls per day. Soak the wheat for 24 hours in water; then drain water off, move the wheat into a dry box or old tub, and allow it to sprout for another 48 hours. It then should have a shoot and root on it. It is now ready to mix for feeding. Put it in the mixing trough and sprinkle about 1 pint of water to each 10lbs. over it. Use the water that the wheat was soaked in; there are good minerals in it. If you have any over use it on your cabbage plants, it will do them good. If you have skim milk, use that in preference to the water. Allow 14 per cent. of meat meal to each 8½lbs. of wheat, 4ozs. of linseed meal, and ½oz. fine salt. Either dissolve the salt in the water or thoroughly mix it with meat meal and linseed. Do not put salt in the water in which you soak the wheat, as it will retard the growth of the germ. If you are using "M.A.B." meat meal, you will not need any bone meal; if not, I would recommend 2ozs. of bone flour. Thoroughly mix the whole together and you will find that the meat meal, etc., adheres to the wheat. Mix the evening feed in the morning and the morning feed in the evening. Pack it up into as small a heap as possible and cover with two bags to keep the moisture in. It will be a nice, warm feed by the time you are ready to use it. In the summer it will be too hot, so spread it out, but keep it covered to keep it moist. This method of feeding must be fed the same as wet mash in troughs, allowing plenty of trough room, about 5ft. to 6ft. troughs per 100 birds.

Do not attempt to change over to this system until August, and then change gradually; otherwise you may throw the birds into a moult or put them off laying. There is no reason why one should not prepare for it now by starting to sprout the wheat. One can gradually change over by feeding a little sprouted wheat mixed with dry wheat, or else put a little in the troughs. The fowls will prefer it to the dry, once they get the taste. No harm will be done to the birds; but do not rush any change.

When it is desired to change over and cut out the mill offals after they are used to the sprouted wheat, cut the mash down gradually and replace it with the sprouted wheat, only do not put the full amount of meat meal, etc., with it at first. Gradually work up the quantity. I recently changed the feed and took 4 weeks to do it. Go through the fowl-house before feeding the mash, and give for a day or two just a little plain sprouted wheat; then carry on with the wheat and meat meal steadily. The fowls will not appear satisfied when one changes over at first, so allow a little extra until there is a little left. When they are used to this feed 8½lbs. will be quite sufficient for them. Make your own measures for the feed. It is convenient to have a bucket for each pen, as the bulk varies according to the weather, and also some grain swells more than others. If at any time—and there are times—the birds do not clean up the feed, say, in 30 minutes, take it away if it is hot weather, and dry it on bags as soon as possible. At this time of the year it will keep for the next feed. Do not mix any left with the bulk of your feed. Put it in one bucket, as it may go sour. Make sure and keep the mixing trough clean. I brush mine out after each mixing. I am now using 50 per cent. barley with my wheat. This necessitates 1 per cent. extra meat meal, as barley is more fattening.

Give greenfeed at mid-day; not more than 1¼ per cent. per bird. The sprouted grain is partly a greenfeed. If any fowls should be poisoned, give them about 5 or 6 lumps of Glauber salts, dry, put them in a quiet place, and feed them a few hours later with soft milk food. Repeat the salts in 12 hours if necessary. Since I have been feeding this way the general health of my fowls has never been better. I have 60 4-year-old breeders, and I was without eggs for 18 days only. The moult has been quicker than usual. The egg yield has been quite satisfactory; in fact, when I started in February they were laying a few less each day, but after I got going they came back and laid

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a few extra each day for a time. When trying out this method start on one pen at a time and make comparisons. More eggs can be obtained by increasing the meat meal. but the health of the fowls will suffer. If one gives less than the amount stated the birds will become too fat. Feed about 10 per cent. of barley even in the summer to provide the necessary roughage. This feed may be fed to chicks at 8 weeks old; of course, by a gradual change, and not quite so much meat meal; try about 7½ per cent. Following is a comparison of the cost of feed for 100 birds fed on the above system and on mill offals at prices advertised in the May issue of the *Red Comb News*:—

	s.	d.
Allowing mash (at 2d. per bird) at 1s. 3d. per bushel—12½lbs.	0	9½
Allowing mash (at 2d. per bird) at 1s. 3d. per bushel—12½lbs.	0	9½
Allowing meat meal 10 per cent., at 17s. per bushel .. .. say	0	2¼
Feed as above	1	9¼
17lbs. wheat, 1s. 1d.; 1¾lbs. meat meal, 2¾d.; linseed meal, ½d.	1	4¼
	s.	d.
Saving per 100 birds	0	5

That would mean a saving of £7 12s. per 100 birds per annum.

PIGS AS A SIDELINE.

[Paper read by Mr. D. H. CHEETHAM at a meeting of the Hilltown Branch on 2nd June.]

If pigs are kept in small paddocks and have exercise, they do much better than if shut up in sties.

Breeds and Breeding.—The Tamworth is a good bacon breed; the sows are good mothers, give a good supply of milk to their young ones, and do not scald in the summer time, which is such a drawback to the white breeds. In fact I have had white pigs die from excessive scald in summer time, and others which would not grow for months on account of sun-scald.

It should be the object of a pig breeder to get 2 litters each year from a sow. This can be accomplished by weaning at 8 weeks and getting the sow in pig again in 2 or 3 days from weaning time. A sow will sometimes come in season about 3 days after farrowing, but it is a mistake to breed her at this stage, as rearing a family of from 7 to 12 is a full-time job. Litters seem to do better if born in autumn or spring, rather than when it is too hot or too cold, as in summer or winter.

Housing and Accommodation.—Pigs are destructive if running loose, and are rather severe on fences unless the fences are specially erected for them of a material such as 8-wire ring-lock fence, with a barb at the bottom and another barb about 8in. above the top of the woven plain wires. This makes a good fence if the wooden posts are placed at every 12ft. or 15ft. Sties must have either wood, concrete, or bricks for floors. Old railway sleepers make first class pig floors. Concrete and brick are both cold, even with the addition of straw. When pigs are run in small paddocks, straw sheds, made of rails and forks and covered with small straw stacks, are very suitable, and the pigs find that an earth bed is first class if kept dry in winter time. Old tanks cut in half and covered with straw make good houses. If it is possible to have a paddock of established lucerne well fenced and the pigs run on this in summer it will be found that it saves a lot of grain and keeps the pigs healthier. This method is used in the Argentine, where pigs are run in herds of thousands.

Feeds and Feeding.—The best feed for a sow after farrowing is pollard and skim milk or pollard and meat meal. A sow does a good deal better with her litter if she is in a small paddock rather than in a sty, as the lack of exercise and close confinement of a sty sometimes upsets a sow, and she will start to eat her pigs; also she likes to get away from 8 or 10 small editions of herself and lie down in peace and quietness for a while. At about 3 weeks of age the suckers will start to look for something in addition to their mother's milk. Whole-wheat put down where they can find it will soon keep them busy chewing and growing. Any of the usual grains, either soaked or crushed, are suitable for feeding growing pigs, but something, such as skim milk or meat meal or linseed meal, should be added to balance the feed and give a sufficiency of protein. Whatever grain is used should be supplemented by a liberal allowance of greenfeed and some mineral mixture, such as super and salt. Wood ashes and charcoal also will be appreciated. Six months is the objective for bacon weight. To do this the pigs must be kept growing all the time without any check.

Sickness.—So long as pigs have a dry, warm place in winter in which to sleep, a cool place to lie in on hot summer days, and a wallow throughout the summer, there should not be much bother with sickness. Worms are about the only trouble, and these affect suckers and weaners more than grown pigs. An effective and cheap remedy for worms in pigs is bluestone.

When pigs are shut up and fed on grain alone and have insufficient exercise, they may develop constipation. A dose of Epsom salts, followed by a regular supply of greenfeed, should effectively remedy this trouble. Pigs appreciate a little clean, raw meat occasionally, and it seems to do them good.

Marketing.—Porkers should be ready at 4½ months and baconers at 6 months. Local markets, that is, Adelaide, are pretty fully supplied, and for any extensive expansion of the pig industry we must look to the export buyers who, fortunately, have been operating for some time. Prior to 1930 the Adelaide market averaged about 1,000 pigs a week. Since the fall in the price of grain and the subsequent use of large quantities as pig feed it is quite usual for 2,000 to 3,000 pigs to be offered and sold at a weekly market at the Abattoirs. This would have left the pig feeders in an awkward position if the export buyers had not stepped in and bought up the surplus over local requirements.

PIG RAISING AS A SIDELINE.

In the course of a paper read at a meeting of the Cambrai Branch on 3rd June, Mr. J. Starick stated:—

The two essentials are breeding and feeding. It is no good having a well-bred pig and not feed it properly.

Type.—We should aim at producing the pig that is required for export, *i.e.*, long and deep sides, big hams, and light shoulder.

The pig that comes nearest to these requirements is the Large White. I prefer breeding from a half-bred Tamworth-Large White sow mated with a pure-bred Large White boar.

Some farmers are still breeding Berkshires, and say, "What was good enough for my father and grandfather is good enough for me." That is not so. We must try and produce a pig that the consumers overseas want, and not try and force a type on to them which they do not want, because that is a sure way of killing our export trade and consequently our own local market.

Breeding.—A young sow should not be mated until she is 8 months old, so that by the time she farrows she would be 1 year old and should be almost fully developed.

A sow which rears less than 8 piglets is hardly up to standard and if she persists in rearing less, one should get rid of her. Suckers should be castrated at about 4 weeks.

Feeding.—The feeding of sows needs special attention. They should not become fat and lazy before farrowing. It is while in this condition that the sows tend to crush the little piglets. Do not feed the sow on anything strong for 12 hours after farrowing. Feed only on sloppy food such as bran and milk; this also helps the sow to milk well. One cannot set down a hard and fast rule as to how much a growing pig should eat. A safe rule is to feed as much as they will comfortably clean up.

To put porkers weighing 70lbs. on the market in 3½ months and baconers weighing 120lbs. in 5 months should be the aim of all pig breeders, and to do this they should be forced from the time they are born. The earlier one can get the pig on the market the greater the profit.

Grain should be fed crushed (dry for preference), soaked or whole, but not boiled. Boiled grain probably looks better but is not so nutritious. Wheat and barley are fairly equal in feed value and also in price. If skim milk is available, no meat meal need be fed.

A lucerne patch should be maintained so that greenfeed can be fed to the pigs. This is a cheaper food than grain, and it helps to keep the pigs in good health. When trapping rabbits, never throw them away. Boil them for the pigs, they relish them. There is no need to clean the rabbits before boiling them.

The profits from pigs are not particularly great in our district because of the lack of some important facilities, such as cheap freight, and more important still, lack of grazing paddocks.

Whether to sell pigs as suckers, porkers or baconers, is a matter of opinion, and is largely governed by fluctuating prices. At times it is possible to buy, say, porkers at almost the same price as suckers. It takes about 5bush. of grain to feed a pig to the porker stage and about 10bush. to a baconer. If grain alone is fed with wheat at 3s. it amounts to 30s.; the price of the sucker is, say, 10s.; making a total outlay of 40s. If a baconer realises 50s., we are making a profit of 10s. per head, or 4s. per bushel for our wheat. It takes approximately 4lbs. wheat crushed to produce 1lb. live-weight; 4lbs. wheat soaked to produce 1lb. live-weight; 5lbs. wheat, whole, to produce 1lb. live-weight.

Ailments.—A common ailment in pigs is mineral deficiency, but our trouble is to find out which particular mineral they are deficient in. However, by feeding one of the following mixtures this can generally be overcome:—

Mineral Mixture 1.—Charcoal, 40lbs.; bonemeal, 20lbs.; salt, 20lbs.; phosphate, 10lbs.; molasses, 10lbs.; sulphur, 5lbs.

Mineral Mixture 2.—5lbs. meat meal to 100lbs. grain; a little slaked lime and charcoal.

Mineral Mixture 3.—1 teaspoon of bicarbonate of soda per day.

The symptoms of mineral deficiency are:—Weak in hindquarters, or, when walking, the pigs may duck as if going under a fence.

Parasites.—Another trouble is "worms." This is a little harder to deal with than the other. The remedy is as follows:—Starve pigs for 24 hours and give oil of chenopodium—8 weeks old, 20 drops; 10 weeks old, 25 drops; 12 weeks old, 30 drops; 6 months old, 1 teaspoon. Follow this up with a dose of raw linseed oil—2ozs. for small pigs and 4ozs. for larger pigs. The above should be repeated in 10 days.

For Tick.—Pour a quantity of old crank-case oil over the pigs.

Mange.—A mixture of raw linseed oil, phenyle, and flowers of sulphur.

Fleas.—Crude oil.

Cost of spraying works out at about 1d. per 7 pigs.

The scales should be used frequently to determine whether certain pigs are growing as they should.

PIGS ON THE FARM.

In the course of a paper read at the June meeting of South Kilkerran Branch, Mr. J. C. Scott-Todd stated:—

The Management of Pigs.—A great deal of success or non-success in pig keeping is due to attention to details or the want of it; it is a sideline which cannot be made by lax or irregular attention. It is a recognised fact that pigs are one of, if not the best, sidelines on the average farm. Especially so in view of the small amount of capital involved in the purchase of foundation stock and the very small outlay required for the housing of the animals.

Members who have tried pig raising without profitable results are prone to condemn the business rather than condemn their own want of, perhaps, experience, patience, and attention to details.

In a number of cases, the setbacks that pig men have received were due principally to the tendency, when pigs were bringing good prices, to rush in and buy young stock at prohibitive prices, feed them up without considering any details in respect to cost, and then be unfortunate enough to sell in a glutted market.

Breeding.—This very unfortunate happening can to a great degree be avoided by the farmer breeding his own stock in a number that is in keeping with his ability to hold them, rather than sacrifice them on a flat market, or on account of scarcity of feed.

To be able to carry out the breeding of one's own pigs, not less than four sows should be kept; and whatever breed one fancies, trueness to type will pay every time.

Of course, a number of farmers do not feel disposed to pay high prices for brood sows, and consequently they use whatever kind and shape is available, not realising that it takes less feed to keep a good animal than it does to tolerate a mongrel, and in addition the result of mongrel-breeding is apparent in the uneven litters, weakling pigs, rainbow colours, and continued bad doers. If, however, one is prepared to breed with any sows available, it is possible to counteract the ill-effects to a great degree by using a good boar. With a good sire, proper attention to culling, and a determination to avoid in-breeding, one can ultimately produce litters that will show adequate returns and a great saving in the feed bill.

A great diversity of opinion is held in regard to the proper age at which to mate maiden sows; but the greatest mistake that one can make is to breed from sows at immature ages.

Well kept young sows may show signs of heat at about 3 to 4 months, but every care should be taken not to breed at that age, for no good results will be obtained. It has been found repeatedly that this practice has led to the birth of small, weak litters, which in most cases are not worth the time wasted; and the bodily strain on the young sow has been apparent in the subsequent litters.

On the other hand, one can breed with sows that are too old, in that they are inclined to be less tolerant mothers, and are not such good doers as younger sows. Therefore a maiden sow that litters about 10 to 14 months old will assuredly give the most satisfactory results.

After the birth of the litter, and after details of the disposing of after-birth, etc., have been carried out, the sow should be disturbed as little as possible.

The young pigs can be satisfied with their mother's milk for three weeks; then arrangements should be made, so that a weak mixture of pollard and milk can be fed to them without interference from the sow, but on no account should the young pigs be over-fed, as they are easily upset, and every setback they receive at this age has a serious check on their development.

At about 4 to 5 weeks castrate the pigs so as to give them at least 2 weeks on the mother before weaning, for the check on them is not so great as when they are operated on and straight away deprived of their natural food.

In regard to the boar, procure as good a boar as is possible, and on no account breed from him under 6 to 8 months old. From that age onward he is full of vitality and can be safely used up to the age of 4 years, when he should be displaced; for from that age he will become sluggish and at times inclined to be savage.

Breeds.—The question of the best breeds to keep and the system of marketing is a matter that the individual farmer must study to make possible the best results.

The Duroc sow crossed with a good Berkshire boar will produce good litters and pigs that are saleable at any time. There are possibly other breeds that may prove to be of equal commercial value, and here again the pig raiser should keep in touch with and study the prices obtained at the local markets.

Marketing.—Taking into consideration the requirements of buyers and the most advantageous sales for the seller, with weaners at from 18s. to 22s. per head a good sow will return from £12 to £15 per year, which, with the initial costs, time, and handling, is the most profitable manner in which to dispose of one's surplus young pigs. If, however, it is desired to hold with the object of fattening, the best policy is to hold until about 7 months, when under proper conditions one should have prime young baconers of around 200lbs., which would give a dressed carcase of 150lbs. to 160lbs. This class of pig invariably brings good prices, and in comparison to heavier pigs the profits will be greater, when one takes into consideration the time, attention, and feed consumed by holding them for a longer period.

Feeding.—Cracked grain, soaked, is one of our best foods; the short period required for soaking will not have the tendency to sour the food, as is likely with the time required for soaking whole grain.

Only enough feed should be soaked to carry one from day to day. An ideal feed is to mix the available milk with the cracked grain and use it at the following meal time. Pollard with skim milk is good for suckers and weaners; it supplies the essentials to build up the young bodies without having a tendency to overdo the fattening process. Young sows that are being held for breeding purposes should not have much milk from 4 months onwards, as the fat generated inside has a detrimental effect on organs and the vitality of the sow.

PIG KILLING ON THE FARM.

[Paper read by Mr. E. Brokate at a meeting of the Springton Branch held on 3rd June, 1936.]

The most suitable pig to kill on the farm is the Large White-Tamworth or Tamworth-Berkshire cross. The Berkshire pig itself is a waste of time and money to kill for farm use because the meat, ham, bacon, etc., have so much fat that the bulk of the people are unable to eat it, and there is, therefore, a lot of waste. Other breeds, especially the Large White and Tamworth, are very evenly balanced in regard to lean and fat. A pig dressing about 200lbs. is the most suitable weight for killing, because it gives a fair proportion of everything, the hams and bacons are a nice size, and the meat itself is good and tender. I prefer killing early in May if the cool weather has set in. By doing so one will have ham and bacon to eat throughout the winter months when one can enjoy them.

A pig should not be given grain of any description within 36 hours of killing, milk only; and nothing at all within 24 hours of killing. This makes the cleaning of the runner much easier and not so liable to break.

Always kill in the morning; then the pig is left hanging until next morning, when it is cut down and taken inside, cut up and sorted for the various things to be made, such as hams, bacons, rice and liver sausage (known as black and white pudding), metwurst, brawn, and pickling meats.

When cutting up the pig, cut out the backbone first, cutting off all meat and fat, the bone itself being cut into smaller pieces for pickling. Then the ribs are taken out, leaving as little meat as possible on them. These are then cut into smaller pieces, also for pickling.

The hams are then cut off and trimmed, and the bone cut off below the first joint, which has a lot to do in keeping the hams. The required number of bacons are then cut out, preferably not too wide, about 9in. or 10in. The shoulders are generally kept for roasts, but put one into pickle to be smoked, and use it as ham. The head is cut into small pieces, and all goes into sausage. I have cut off a hogshead, which I use for pickling, and find it very suitable.

The hams are treated first. Get a pointed stick—or a steel will do—and poke holes in the skin to make sure that the salt or brine penetrates properly. Before putting the hams in rub a mixture of 1 part saltpetre to 10 of salt well into the hams. Then put all meat, etc., in layers on top of the hams and sprinkle the mixture over every layer of meat, and finally the bacons, which are rubbed with the mixture first, and then put in with the lean downwards, and more of the mixture sprinkled over them. Four or 5 days later any fluid that has accumulated at the bottom is drained off and there is then added a salt brine which has been prepared previously by boiling the water and adding enough salt and a little saltpetre to float an egg. The brine must be perfectly cold before being poured over the prepared meat. The hams are left in pickle for five weeks and the bacons four weeks, but they must be turned several times during that period to make sure they are well pickled. They are then hung up until dry before being smoked, which takes about 4 to 5 days.

Sausage Making.—The head (which has been previously cut up), the liver, all meat that has any sign of blood, and the pieces of skin from various parts are all boiled until tender; then they are sorted for rice or liver sausage. The liver and all meat with plenty of fat are then minced up with a small onion. Add salt, pepper, thyme, a little mixed spice to taste, and fill into runners. This is called liver sausage or white pudding. The rest of the meat is then minced up and mixed with rice (which has been boiled), salt, pepper, marjoram, mixed spice, cloves, and a little blood which has been saved when sticking the pig. It is then ready to be filled into the runners. This is called rice sausage or black pudding. All sausage must be simmered for about 20 minutes. If brought to boiling point they will burst, with a lot of waste resulting.

The next process is the making of the metwurst. Take ½lb. of beef (good) to every pound of pork and put it through the mincer twice in order to make sure it is fine enough. It is then well mixed, and the following ingredients added:—Salt, pepper, sugar, saltpetre, and a little garlic water to taste (the garlic is well bruised and then a little water added). It is well mixed again—this cannot be done too often—and then it is filled in the bungs and hung up in the smoke-house for a day or two, when it is ready for smoking, which takes approximately 2 days.

For the brawn, take the trotters and the tail and boil them in salt water until the meat leaves the bones. Just before taking off add 1 cup of vinegar. Take the meat off all the bones, cut it up, and put it in basins to set, when it is ready for use.

THE PHYSICAL AND CHEMICAL SIDE OF FARMING.

In the course of a paper read at a meeting of the Coonalpyn Branch on 3rd June, Mr. A. Chandler stated:—

Cultivation.—Perhaps the most important effect as far as this district is concerned is the conservation of moisture. The moisture in the soil escapes in two directions—upwards and downwards—and as we have little or no control of the downward loss, we can disregard that part.

Few people realise that a tremendous quantity of the moisture in the soil (even the moisture that is deep down in the soil) is lost by evaporation from the surface. How does this water reach the surface? Some say that the sun "draws" it up. This is quite wrong, for if such were the case cultivation would be useless as far as the moisture conservation is concerned. The water travels upwards of its own accord, and when it reaches the surface, the warmth of the sun changes it into water vapour, which, being lighter than air, floats away. The action of the water rising in the soil is known as capillary action, and is due partly to the surface film, which is present on all liquids. The more compact the soil, the easier it is for the water to rise to the surface. By keeping the surface soil loose, the water is, to a great extent, prevented from rising.

Manuring.—Manures and fertilisers are applied to increase the supply of plant food in the soil. There are 10 inorganic elements necessary for a plant to grow, viz., carbon hydrogen, oxygen, nitrogen, sulphur, phosphorus, iron, magnesium, potassium, and calcium. Continual cropping, especially with similar crops, reduces the supply of plant food in the soil, and, to keep his land in good order, a farmer must put into the soil as much plant food as his crops take out.

Artificial manures are mainly used because of their convenience and also because a farmer can choose the plant food that will benefit his crop in some special way. The plant foods mainly used by crops are phosphates, nitrates, and potash. Each of these affect a plant in a different way. Phosphates supply phosphoric acid, which helps in the ripening of the plants (mainly). Nitrates supply nitrogen, which is the most important of plant foods, as it produces a healthy growth. If there is much present in the soil a vigorous growth results. Potash produces starch, sugar, and fibre. Farmyard manure contains all of these plant foods, and is very valuable; wet seaweed is equally valuable. The principal fertiliser used in wheatgrowing is superphosphaate. This supplies the phosphoric acid, which helps the ripening and therefore produces good grain. Superphosphate originates in the sea, where various types of small sea animals feed on smaller organisms rich in phosphates, thus storing up their supply of phosphate. These animals are devoured by fish, which in their turn are devoured by sea-birds. Millions of birds devour enormous quantities of fish, and, as a result, large deposits of bird manure, called guano, accumulate. The phosphoric acid in this guano dissolves in the limestone underneath and forms phosphate of lime or phosphate rock. This will not dissolve in water, and is therefore of little value as a fertiliser. When it is treated with sulphuric acid, it is converted into superphosphate and becomes a very valuable fertiliser. Sulphate of ammonia supplies nitrogen to the soil, which produces a vigorous growth. This fertiliser is obtained as a by-product in the manufacture of coal-gas.

Lime does very important work in the soil. It loosens up sticky soil and also tends to bind up loose soil. It is not a manure, because it supplies no plant food, but it neutralises or kills the acid which is formed when vegetation decays or when artificial manures are applied, thus preventing the soil from becoming sour. It also helps the work of all fertilisers. Much of the plant food is insoluble and of no use to the plant. The lime acts chemically on these substances and changes them into available plant food.

We have discussed the fertilisation of the soil as far as the chemical treatment is concerned, but there is another important method which has been practised for many centuries, namely, the rotation of crops. In districts such as this, rotation is not carried out so intensively as in more favourable districts and in other parts of the world. In fact, much of the rotation here is practised mainly for the prevention of disease.

It is well known that crops of a like nature, such as wheat, oats, and other cereals, take the same types of plant food from the soil. These are known as exhaustion crops. Other crops, such as peas, beans, and root crops, are known as restorative crops, because they restore the main plant food to the soil in nitrogen.

The air consists of four-fifths nitrogen, and although plants and animals (including human beings) cannot live without this element, they cannot obtain it directly from the air, for, as you have discovered, when the supply of nitrogen in the soil is low it has to be restored chemically or by the laws of nature. Plants such as beans, peas, clovers, etc., have the peculiar effect of supplying nitrogen to the soil. This is brought about by the action of bacteria in the roots, which convert the nitrogen in the air into a form which is available to all plants. This is one of Nature's ways of balancing the supply of plant food.

To preserve the plant food in the soil, exhaustive crops should be followed by restorative crops. This, of course, is not always possible, and in many districts it is seldom economical, so the farmer corrects the plant food deficiency by the use of the required type of artificial fertiliser.

WATER IN THE SOIL.

[Paper read by Mr. E. Yeates at a meeting of the Hartley Branch on 3rd June.]

Water is so necessary to promote growth that its presence in the soil is worthy of our consideration. It exists in three forms. Hygroscopic moisture is a minute film surrounding all soil particles. It is of no use to plants, but is always present however dry the soil may appear to be.

The second form—capillary water—is the one and only source from which agricultural plants draw their moisture, consequently it is most important. It consists of a film around the soil grains, and dissolves from them all the elements which a plant requires; it must be remembered that a plant only takes in dissolved nutriment. The method by which this moisture is drawn in through the roots of a plant is interesting. The root hairs are covered on the tip by a membrane, through which dissolved substances will pass. The direction of the passage depends on the strength of the solutions on opposite sides of the membrane. Usually the stronger solution exists in the plant and this stronger solution draws the weaker to it. If salt is added heavily to the soil, the outside solution is strengthened until the plant solution is the weaker, consequently moisture is drawn from it, causing the plant to wilt and die. This explains why salt can be used as an effective weed killer.

Gravitational water is the excess of capillary moisture in the soil, and lodges in the space between the soil particles. It is present in water-logged areas, for in well drained soils it quickly gravitates downwards. Water-logging of ground for any length of time soon causes most plants to yellow off and die because air is prevented from reaching the roots.

As capillary moisture is so necessary, and gravitational water so detrimental for growth, there must be a condition when the correct amount of water is present. This ideal is realised when the soil is thoroughly wet and yet will not exude drops of water when squeezed together by the hands. To bring about this optimum water content drainage is essential, and in districts of heavy rainfall and heavy soils man-made drains are often necessary.

Nature's method of supplying soil moisture is by one way—rain, but it is lost in many ways. Drainage, both from the surface and underground, accounts for a large amount of loss, but evaporation is the most important, because it robs the ground of moisture that could be used by plants. Capillary moisture is always rising to the surface and is consequently always being evaporated to some extent. To reduce this to a minimum cultivation has become a standard practice, because by the preparation of a mulch the capillary tubes are broken. Australia's dry climate has made necessary some kind of water conservation, and it is fallowing that has made possible the heavy yields of to-day, more so perhaps than super. It has been estimated that as much as 5in. of rain is conserved in one fallowing period.

Water is also taken from the ground by the growth of plants. A small amount of this is used by the plant itself in building up its body tissue. A young wheat crop is approximately 68 per cent. moisture, and green lucerne 73 per cent., but this is relatively small compared with the amount transpired by a plant. The amount of transpiration is considerable, *e.g.*, a large sunflower will exhale as much as a pint of water during a summer day. Lucerne transpires much more quickly than other green crops, 800lbs. being lost per acre, but only 230lbs. on the same area of wheat, consequently lucerne demands a tremendous amount of water to grow prolifically. Plant leaves are so adapted that the pores close as the leaf wilts, stopping to some extent the amount evaporated through the plant. After all these sources of moisture loss have done their worst, is it any wonder that there is very little moisture left after summer?

MANAGEMENT OF A MIXED FARM.

At a meeting of the Truro Branch of the Agricultural Bureau held on 18th May, Mr. E. W. Berry read a paper entitled, "What I have learned from Experience in the Management of a Mixed Farm." In the course of the paper Mr. Berry stated that during 22 years as a member of the Agricultural Bureau he had found that mixed farming was a most interesting occupation, provided the farmer was situated in a district of 15 to 20in. rainfall, and could get a payable price for his products. The most profitable method of marketing oats and barley was to turn them into lamb or pork, preferably lamb. A suitable plant to work a 600 acre farm would consist of an 8-horse team with 1 spare horse, a 5-furrow plough, 8 harrows, a 16-hoe combine, and an 8ft. harvester in preference to a header. The harvester could be worked with only 6 horses, thus providing 2 spare horses, which should, if possible be mares with foals. The team should always be kept up to a good standard. At seeding time a good team would sow 17 to 20 acres a day, whereas a slow team would only cover 12 to 14. Working the land for wheat growing depended largely on how the farm was subdivided. A large paddock should be worked on a 3-year rotation, sowing, say, 50 to 60 acres to oats and barley. It was better to sow, say, 7½ bags per acre twice in 6 years, rather than to grow 3 crops out of 5 bags in the same period. The former pratice encouraged the growth of clovers which greatly improved the land. Fallowing should be started in July, ploughing fairly wet and not more deeply than 3in. Harrowing and cultivating should be done as weeds made it necessary, but it was not wise to cultivate deeply before seeding. For the Truro district late seeding was preferable, say from the middle of May to the end of June, sowing late or mid-season wheat. It was a good plan to have about 20 bags of early varieties of wheat on hand, for use in case the season opened exceptionally late. Seeding should be at the rate of 60 to 75lbs. of graded seed per acre—that amount being the equivalent of 10 to 12lbs. more of ungraded seed—with from 100 to 150lbs. of 45 per cent. super, the more the better.

Livestock.—It was not advisable to run sheep in with big stock. If sheep had the run of the farm they would eat all paddocks bare, with the result that if the first rains came rather late, there was no dry cover for the young feed; and consequently feed would be scarce until August and sometimes later. When sowing oats or barley in a paddock which was to be left out for a year or two, it was a good plan to sow some Wimmera Rye grass mixed with super. It made excellent feed, even when it was dry on the stubble. Where a good dressing of super was applied to the land, stock received a certain amount of it through the feed.

Superphosphate was very important. No farmer would think of sowing a crop without super, yet if he could put on ½cwt., there was no reason why he could not apply 1½cwt. With super at £3 7s. 6d. per ton, the cost of the extra super would equal the price of 1bush. of wheat per acre, and the increased return would surely be more than that. Some farmers were in a vicious circle, in that they had cut down the super on account of the low price of wheat, resulting in a poor crop. Consequently they had less money for super the next season, and the crop went yellow, with green patches where horse or cow-manure had been, and provided no feed for stock, and the land was becoming covered with stinkwort. Had such farmers applied a good dressing to the land, they would have grown a better crop, which would have enabled them to give a heavier dressing in the following season, with a still better return, and with a much better stock carrying capacity. Points to be emphasised were the following:—1. Do not forget to attend the Bureau meetings regularly; (2) fallow early and not to deeply; (3) Do not crop more often than once in 3 years; (4) Do not try to do more than you are able to attend to properly; (5) Do not put sheep and cattle in the same paddock; (6) Do not fear to use super. It will not blight the wheat, and 1cwt. costs only the price of 1bush. of wheat. Five years ago it cost as much as 3bush.; (7) Use graded seed wheat if possible, and give the small grain to the fowls.

LUCINDALE SIXTH ANNUAL PASTURE COMPETITION, 1935.

[*Judges*: E. S. ALCOCK (District Agricultural Instructor) and G. W. LANGBERG.]

In the pasture competitions conducted by the Lucindale Agricultural Bureau in 1935, three entries were received for sown pastures and the Virgin Scrub Competition attracted eight entries.

Entries for each year are shown below:—

Year.	Natural Pasture.	Sown Pasture.	Virgin Scrub.	Total.
1930	8	12	—	20
1931	5	12	—	17
1932	5	10	—	15
1933	7	13	—	20
1934	—	3	—	3
1935	—	4	8	12

The Cup for Natural Pastures has been won outright, and this class was replaced with the Virgin Scrub Competition.

Trees, broom bush, and heath in 1934 before work was commenced (S. F. Grieve).

It is necessary in this district to top-dress early because it is impossible to drive a heavy loaded vehicle over the paddocks during winter. The heavy rains came earlier than usual, and many landholders were caught with this work not completed, and because of the boggy nature of the land, it had to be left. It was easy to see the paddocks and portions of paddocks dressed with super. Even the land which was fairly wet and even under water during the winter months showed quite a good deal of improvement after top-dressing.

The pasture as it appeared in Autumn, 1936 (S. F. Grieve).

To get the best out of pastures, they need to be sown just as carefully as a cereal crop and should be given the same care and attention but generally, this is not done. The general opinion seems to be that it is only a pasture and it does not appear to matter when or how it is fed or treated.

Most pastures are allowed to grow too rank at certain times. If they cannot be kept down by grazing, they should be shut up and cut either for ensilage or grass-hay, and the stock crowded on to a smaller area in order to keep the pastures in good condition.

Shade is an important item, especially during summer and winter. One very valuable tree which grows well in this district is the Dry Land Titree—it is a good shade, does not grow high, and there is no danger of limbs breaking, as is the case with some of the gums.

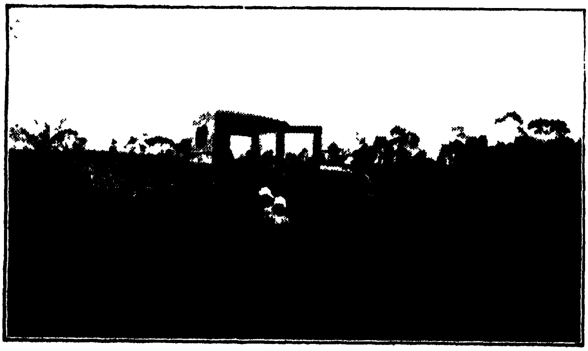
SOWN PASTURE COMPETITION, 1935.

The points awarded under the various headings are given below:—

Competitor.	Address.	Position.	Bulk of Pasture per Acre.	Type of Plants.	Freedom from useless Plants.	Feeding Value.	General Care.	Area.	Total.
			30	15	25	10	10	10	100
R. J. Legoe	Callendale	1	26	14	23	9	8	10	**90**
R. G. Nosworthy	Lucindale	2	24	13	22	8	7	10	**84**
A. T. Williams	Conmurra	3	23	12	22	8	7	10	**82**
W. O. Smith	Lucindale	4	20	10	20	7	6	10	**73**

COMMENTS ON WINNING CROP.

R. J. LEGOE.—"Callendale" Lucindale 64 acres. A very fine paddock, sown with Rye Grass, Subterranean Clover, and White Clover. Portion of larger paddock, and was fenced off early in the year. A very nice pasture, quite a good mixture and had been well grazed, as the following figures below indicate. There was a little Silver Grass and Slender Clover. Topdressed with 1 bag super per acre. Grazing is given as follows:—



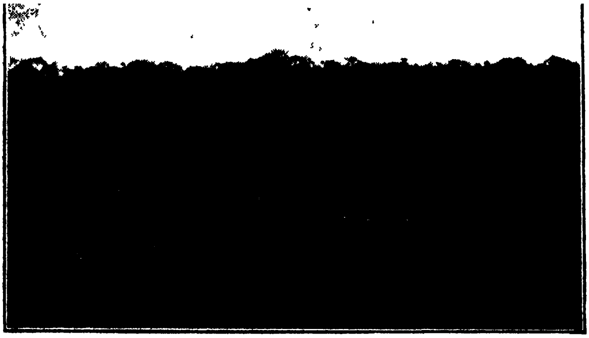
Rye grass, oats, and clover, 1935 (S. F. Grieve).

1935.			
March 16–20	4 days	600 sheep	2,400 sheep days
March 25–28	3 days	289 sheep	867 sheep days
April 5–17	12 days	41 sheep	492 sheep days
April 17–26	9 days	250 sheep	2,322 sheep days
April 26–May 13	17 days	251 sheep	4,267 sheep days
May 14–August 13	91 days	364 sheep	33,124 sheep days
August 15–September 25	41 days	296 sheep	12,136 sheep days
September 25–26	1 day	784 sheep	784 sheep days
September 28–October 8	9 days	150 sheep	1,350 sheep days
October 8–29	21 days	778 sheep	16,338 sheep days
November 1–4	3 days	299 sheep	897 sheep days
November 7–14	7 days	334 sheep	2,338 sheep days
	218 days		77,315 sheep days

$$\frac{77315}{365 \times 64} \doteq 3.309 \text{ sheep per acre per year}$$

VIRGIN SCRUB TO PASTURE COMPETITION.

The object of this Competition was to ascertain the best method to establish a pasture from virgin Scrub and at the same time it was hoped that all Competitors would keep a record of the labour involved on this work so that the actual cost could be ascertained. Each competitor was requested to keep a record of the number of days work on their entry, the number of men, the number of horses and implements used and, where contracts were let, to give the cost of same per acre. The Competition will be conducted for 5 years with an annual prize each year, and a champion prize at the end of the fifth year (1939).



The pasture in 1934, showing yaccas and heath in foreground (S. F. Grieve).

This Competition will show the various methods employed by different individuals in establishing pastures. Some have fallowed their land and left it bare for 12 months; others have rung and poisoned the gums and then cut them down and sold the wood for burning; others have pulled them down and burnt them in heaps. Some have sown cereals and others a summer crop. Another competitor sowed Subterranean Clover and expected it to make enough growth to get a burn to destroy the gum shoots. Another competitor put an Oat crop with the Clover and grasses in the first year. Nobody attempted to use Wimmera Rye Grass for the first crop; the grass grows readily and should carry a fire well.

Broom bush and heath on left and rye grass and clover on right, 1935 (S. F. Grieve).

All the entries were inspected before work began, and in order to put all on an even footing, they were handicapped according to the type of soil and the vegetation growing on them. They were classified and handicapped as follows:—

Stringy-bark scrub	100 points
Hill, Red, or Blue Gum and Yacca scrub ..	75 points
Heath and Yacca	40 points
Heath	30 points

The lightest and poorest type of soil with the most difficult clearing was given the highest points of advantage. Entrance fee, 10s., for each entry, and this amount to cover the period of 5 years. Area not to be less than 20 acres. This year 8 entries were received, and as these covered quite a number of different types of soil and vegetation, some interesting information should be obtained.

Some difficulty was experienced in arriving at a satisfactory scale of points to judge the entries. However, it was decided that as this was a pasture competition, all entries would be judged at the same time and from a grazing standard, even if they were eventually cut for hay or harvested for seed.

Commencing clearing, 1934 (T. W. Ferguson).

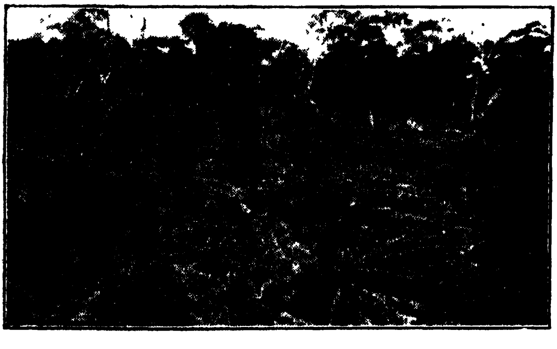
Land and Vegetation.—It was agreed to allow the maximum 100 points handicap for entries whose natural vegetation consisted of Stringy-bark and Bracken Fern Land; Red Gum, Hill Gum, Yacca, etc., 75 points; Heath and Yacca, 40 points; Heath only, 30 points.

Germination and Growth (50).—Considerable skill is required to grow a good crop on virgin land, and, therefore, "Germination and Growth" was given 50 points.

Records (30).—The value of complete records is invaluable in such a Competition as this, and therefore, 30 points were awarded.

Fencing and Water (50).—The areas must be fenced off securely to protect them from vermin so that they can be fed off properly. Good clean water is essential for grazing animals.

Crops Used (50).—This is important, because there is not one of the areas entered on which some crop cannot be grown.



Yaccas grubbed and before burning, 1934 (T. W. Ferguson).

Feeding Value of the Plants Sown.

Management (50).—Success depends on good management, and 50 points were allotted for work done carefully and on economical lines.

DETAILS OF POINTS AWARDED.

Name.	Disposal of Land.	Land and Natural Vegetation.	Germination and Growth	Records.	Fencing and Watering.	Type of Plants Sown.	Feeding Value.	Management.	Total.
			50	20	50	30	30	50	300
S. F. Grieve—Oats and grasses		74	40	19	5	80	30	15	214
S. F. Grieve—Clovers ..		75	40	19	5	30	30	15	214
T. W. Ferguson—Rape ..		60	30	15	40	20	25	10	200
T. W. Ferguson—Wheat		60	25	15	40	15	20	12	187
W. O. Smith—Subterranean Clover		70	25	18	20	15	20	8	176
R. J. Legoe—Part ploughed		40	—	—	—	—	—	—	40
R. G. Nosworthy—Ploughed		35	—	—	—	—	—	10	45
W. M. Secker—Not started		80	—	—	—	—	—	—	80

S. F. Grieve, "Karana," Lucindale, 40 acres (2 entries).—Rather light soil carrying small Yacca and a few scattered Hill Gums. Recently burnt when inspected in 1934, also a few patches of Broom Bush and black Grass. This area was ploughed with a disc plough, 5-furrow, and ploughing was started on 16th November, 1934, and completed first week in February, 1935. Where the fire went across this plot, the land ploughed and went down better than the unburnt portion. This was cross-ploughed the first week in March and completed in second week in April. This second working made a splendid job, and it was then harrowed, which took three days to complete. This was then sown with 60lbs. Algerian Oats, 40lbs. super, with the following seeds:—2½lbs. McDougall Wimmera Rye Grass, 3lbs. Subterranean Clover, and 1lb. of the following mixture per acre:—25lbs. Kentucky Blue Grass, 20lbs. Brown Top, 20lbs. Red Clover, 50lbs. Bokhara Clover, 10 *Phalaris Tuberosa.* All seeds were mixed with the super which were sown through a top-dresser with 90lbs. super per acre, followed behind the combine. Seeding started on 2nd May and was completed

May, 1935, after yaccas were burnt (T. W. Ferguson).

Dry trees after poisoning, and burnt yaccas, May, 1935 (T. W. Ferguson).

23rd May. Total area on this black, 115 acres. Cost per acre, £1 14s. 7½d. Grazed with 200 sheep which were put in on 16th September.

Details of Expenses for 115 *Acres.*

	£	s.	d.	£	s.	d.
Wages—Cleaning saplings, 14 days at 10s. per day	7	0	0			
Ploughing	25	0	0			
Harrowing	3	10	0			
Sowing	9	10	0			
				45	0	0
Fuel—484 gallons kerosene	27	4	6			
Oil	3	2	0			
10 gallons petrol	0	17	6			
				31	4	0
Seed—Clover, Wimmera Rye Grass, etc.	52	15	0			
Oats	12	0	0			
				64	15	0
Super—7 tons at £3 13s. 6d.				25	14	6
Depreciation (value of plant approximately £320)				30	0	0
Breakages				2	8	6
Total				£199	2	0

Cost per acre, £1 14s. 7½d.

The Oats made quite good growth, and the Wimmera Rye Grass and Subterranean Clover germinated well and also made good growth; some Brown Top and Bokhara Clover and Red Clover, but very little of the other plants were to be seen, and this area looked quite promising. Mr. Grieve said he would remove the sheep at the end of October to give the plants a chance to re-seed themselves.

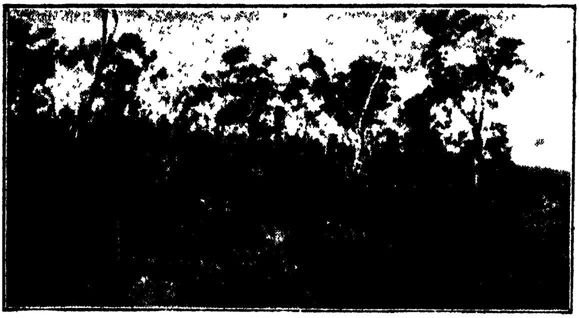
Large dry trees, May, 1935 (T. W. Ferguson).

T. W. Ferguson (2), Baker's Range, Lucindale.—Similar to the other entry by the same competitor, but was given different treatment in clearing timber and also first crop. The Yaccas were grubbed off and the timber ring-barked and poisoned. The timber was pulled down with a tractor and dragged into heads on the head-lands. A good deal has yet to be dealt with. Cost per acre, £3 14s. 2d.

Clearing is not by any means completed. Rape had germinated well and looked very promising, and this should make quite a good seed for a pasture crop.

T. W. Ferguson (1), Baker's Range, Lucindale, 20 acres.—Fairly fertile loam; vegetation mainly fairly large Yaccas, rather thick with a good many trees, as shown in the photo. The Yaccas were grubbed out by hand, and the timber burnt after it had been ring-barked and poisoned. The logs were dragged into heaps and the loose stone carted off. Ploughed with a tractor and sown with 1¼bush. of Major wheat and 1cwt. super per acre. Cost per acre, £4 6s. 8d.

This area is not properly cleared. The wheat crop was only fair; rather thin and did not look very robust.



Before clearing was commenced, 1934 (W. O. Smith).

W. O. Smith, Lucindale, 30 acres.—A fairly level block; the soil a fertile loam which, with the addition of phosphates should grow a good pasture. Scrub consisted of Yaccas, Hill Gum, Blue Gum, small Honey Suckle, and some grass in the open places. The timber had been poisoned and ring-barked. This work was done partly by day work. Mr. Smith considers the cost (10s. per acre) rather high, despite the fact it was rather heavily timbered—this was done in 1927. Falling and burning of dead timber cost 5s. per acre. This was let by contract after a much lighter timber had been removed gratis by people requiring firewood. This

The land in 1935 (W. O. Smith).

Part ploughed, October, 1935 (R. J. Legoe).

was done December, 1933, to February, 1934. All the stumps were cut off level with the surface. Ploughed with twin disc during June and July, 1935, and then cross-ploughed. 6lbs. Subterranean Clover seed per acre and 1 bag 45 per cent. super per acre. These costs were approximately

Before ploughing, 1934 (R. G. Nosworthy).

£2 per acre. Mr. Smith hoped the Clover would make sufficient growth to carry a fire to check growth of shoots, etc. Rather rough with some gum boughs, dry Yaccas, little Silver Grass, and few thistles; Clover sown too late to make good growth. Nevertheless, a good foundation for a pasture.

Ploughed land, October, 1935 (R. G. Nosworthy).

R. J. Legoe, Callendale, Lucindale, 20 acres.—A good heavy type of **fertile loam. Mainly fair-sized Yacca with some Hill and** Blue Gums.

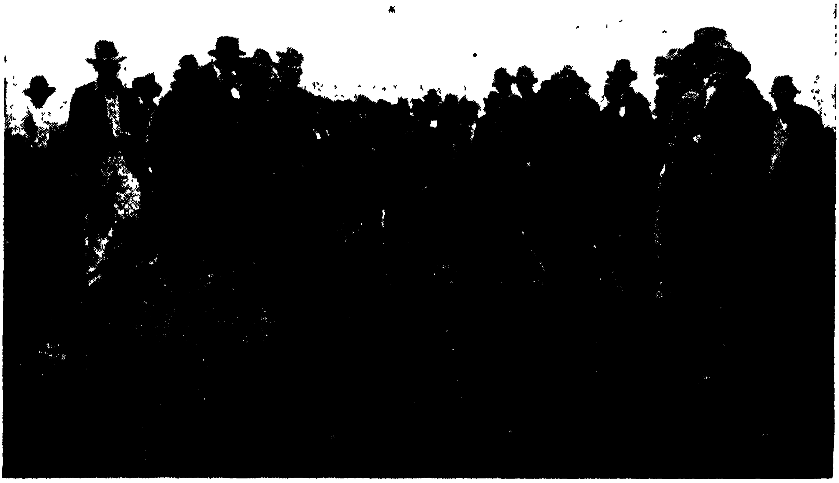
Before clearing, 1935 (W. M. Secker).

Very little has been done to this area. Last spring a start was made **with ploughing, but owing to a breakdown, this had been left.**

R. G. Nosworthy, Lucindale, 20 acres.—A very fertile loam with a good deal of organic matter in it. This area should grow an excellent pasture. Mainly Yacca with very occasional Honey Suckles and Sheoaks; also a few White Gums. Ploughed and left in the rough. No great difficulty was experienced in the clearing of this area.

Another view before clearing, 1935 (W. M. Secker).

W. M. Secker, Ardune, Lucindale, 20 acres.—Rather light and sandy, but should carry a good pasture. Mainly Bracken Fern, odd Manna Gum, and Stringy-bark. No work was done to this area up to December, which will be the most difficult to clear effectively.



A Pruning Demonstration given by one of the judges at the Annual Pruning Competition at McLaren Flat on 30th May, 1936.

SUMMARY OF REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
South-Eastern District.				
Millicent	6/4/36	80	Address—W. J. Spafford	L. C. Hutchesson
Millicent	11/5/36	90	Address—L. De Garis	L. C. Hutchesson
Millicent	22/5/36	7	"Farm Economy"—K. K. Skeer	L. C. Hutchesson
Kybybolite	12/5/36	—	"Developments in Lucindale District"—R. J. Legoe	D. Schinckel
Allandale East	5/6/36	12	Question Box	R. T. Laslett
Kybybolite	2/6/36	28	"Breeding and Culling the Merino Flock"—W. L. Staude	D. Schinckel
Wolseley	10/2/36	9	Address—E. S. Alcock	E. W. Sharrad
Wolseley	12/3/36	8	Harvest Reports	E. W. Sharrad
Wolseley	7/5/36	—	Annual Social	E. W. Sharrad
Tantanoola	6/6/36	11	"Tree Planting"—Thos. Edgcumbe	L. J. C. Osborne
Upper North District.				
Appila-Yarrowie	5/6/36	11	"Harvest Operations"—C. Bottrall	E. H. Wurst
Warcowie	2/6/36	8	"Should Wheat be Grown Outside Goyder's Line?"—E. C. Jarvis	A. F. Crossman
Wilmington	9/6/36	35	Pruning Demonstration—J. B. Harris	Chas. Cole
		21	"Ailments of Horses"—J. Rundle	
Murraytown	20/6/36	8	Discussion	E. B. Pitman
Mid North District.				
Booborowie	18/5/36	12	Annual Meeting	A. T. Fairchild, jun.
Booborowie	26/5/36	4	Programme arrangements	A. T. Fairchild, jun.
Hilltown	2/6/36	14	"Pigs as a Sideline"—D. H. Cheetham	L. J. Harvey
Wandearah	2/6/36	13	Address—E. L. Orchard	L. A. Jacobs
Beetaloo Valley	1/6/36	10	"Fodder Conservation"—J. Halse	B. W. Giddings
Mount Bryan	3/6/36	—	Address—A. G. Edquist	A. A. Jeffries
Narridy	6/6/36	26	Address—E. L. Orchard	J. Klingner
Redhill	14/5/36	8	"Trip to South-East"—H. J. Crouch	L. Harris
Redhill	16/6/36	16	Address—W. C. Johnston	L. Harris
Lower North District.				
Rosedale	2/6/36	17	Discussion—"Soil Erosion"	W. E. Georg
Sutherlands	1/6/36	19	Address—C. A. Goddard	L. B. Doecke
Lyndoch	5/5/36	27	Address—A. G. Strickland	J. S. Hammat
Lyndoch	2/6/36	12	Pruning Competition Arrangements	J. S. Hammat
Light's Pass	1/6/36	19	"Soldering"—J. F. Jacob; "Shed Construction"—W. Crook	C. A. Verrall
Cambrai	6/5/36	56	Address—C. A. Goddard	H. F. Stevens
Cambrai	3/6/36	36	"Cows on the Farm"—J. Miller; "Pigs as Sideline"—J. Starick	H. F. Stevens
Koonunga	5/6/36	15	Pruning Demonstration—J. B. Harris	H. Mibus
Black Springs	2/6/36	6	Discussion	K. H. Dunn
Truro	18/5/36	7	"Management of a Mixed Farm"—E. W. Berry	L. S. Davis
Brownlow	2/6/36	13	Address—C. A. Goddard	V. G. Semmler
Truro	15/6/36	51	Address—W. J. Spafford	L. S. Davis
Upper Wakefld.	7/5/36	13	Debate—"Sheep v. Wheat"	H. W. Gregor
Nantawarra	11/6/36	9	"Tree Planting"—G. Henderson	M. P. Hamdorf

Summary of Reports Received—*continued.*

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Yorke Peninsula District.				
Paskeville	2/6/36	—	Question Box	J. Prouse
South Kilkerran	4/5/36	40	Address—Mr. Bradley	R. E. Hasting
South Kilkerran	1/6/36	14	" Pigs "—J. Scott-Todd	R. E. Hasting
Boor's Plains .	4/6/36	17	" Buildings "—M. D. Wright	S. G. Chynoweth
Weavers	1/6/36	10	Annual Meeting	H. W. Cornish
Western District.				
Kelly	30/5/36	18	Annual Meeting	F. R. Illman
Taragoro	4/6/36	7	" Farm Blacksmithing "—S. Barber	A. A. Edwards
Brimpton Lake	14/5/36	11	Paper from *Journal*	P. H. Wagner
Koppio	3/6/36	16	Addresses—N. Sedunary and H. D. Adams	M. T. Gardner
Butler	8/6/36	14	Discussion—Pig Breeding	C. F. Jericho
Nunjikompita .	4/6/36	9	" Plant Nutrition "—Hon. Sec. ..	S. R. Morgan
Palabie	28/5/36	10	Address—W. H. Brownrigg	A. E. Place
Warramboo ...	5/6/36	7	" Seeding "—P. Tonkin	P. E. C. Daniel
Laura Bay	12/5/36	19	" Value of Organization "—E. D. Barrett; " Economic Disadvantages "—W. Barnett	P. S. Morrison
Laura Bay	10/6/36	11	" The Wheat Industry "—B. Stapleton	P. S. Morrison
Goode	11/6/36	8	Wool Demonstration—C. A. Goddard	B. A. Linke
Kyancutta	2/6/36	10	Address—H. C. Brice	E. A. Kelly
Kyancutta	15/6/36	10	Address—C. A. Goddard	E. A. Kelly
Wallala	13/6/36	7	Discussion—Pastures	C. F. Zippell
Brimpton Lake	11/6/36	9	" Fallowing "—E. S. Ashman....	P. H. Wagner
Cungena	4/6/36	12	Annual Meeting	A. A. Voumard
Eastern District.				
Kulkawirra....	26/5/36	12	Address—C. A. Goddard	H. J. Elliot
Karte	12/5/36	21	Address—C. A. Goddard	M. E. Small
Coomandook ..	2/6/36	24	Address—R. L. Griffiths	W. R. Trestrail
Jervois	21/5/36	8	" Herd Testing "—M. Carlyle ...	F. P. Baily
Pinnaroo	3/4/36	13	Discussion	H. L. Badman
Pinnaroo	22/4/36	180	Address—W. J. Spafford	H. L. Badman
Pinnaroo	13/5/36	14	Address—C. A. Goddard	H. L. Badman
Coonalpyn	3/6/36	19	Annual Meeting. " Chemical Side of Farming "—A. Chandler	C. L. George
Karte	3/6/36	18	Annual Meeting. " Sore Shoulders "—A. H. Gum	M. E. Small
Ramco	1/6/36	7	Discussion—Sultana Pruning	J. J. Odgers
Chapman Bore.	6/4/36	10	Address—R. L. Griffiths	J. P. Krollig
Chapman Bore.	30/4/36	70	Address—W. J. Spafford	J. P. Krollig
Chapman Bore.	11/5/36	13	Address—C. A. Goddard	J. P. Krollig
Chapman Bore.	8/6/36	13	" Poultry "—W. Burbridge......	J. P. Krollig
Marama	18/6/36	7	Discussion	Thos. C. Hinkley
Devlin's Pound	17/6/36	25	Address—H. B. Barlow	H. A. Loffler
South and Hills District.				
Ironbank	3/6/36	11	Address—H. H. Orchard	C. M. Morgan
Meadows	2/6/36	25	" Poultry Feeding "—S. Eyles ..	E. W. Young
Gumeracha ...	6/4/36	6	" The Agricultural Bureau "—B. Cornish	R. G. Almond
Gumeracha ...	4/5/36	15	" Fertilisers "—F. Guster	R. G. Almond
Hartley	3/6/36	10	" Farmer's Ideal Poultry Farm "—W. J. Brook; " Water in the Soil "—E. Yeates	W. J. Brook
Springton	3/6/36	8	" Pig Killing "—E. Brokate	P. L. Miller
Inman Valley..	10/6/36	17	Addresses—H. B. Barlow, P. D. Jefferey	S. F. Hacklin
Yundi	17/6/36	12	" Potato Growing "—B. White ..	J. J. Guiney

WOMEN'S BRANCHES.

DRESSMAKING AND THE ART OF DRESS.

The following paper on "Dressmaking" was read at a meeting of the Monarto South Branch by Mrs. E. A. Thomas:—The first move in constructing a gown from a pattern of stock proportions is to place the pattern against the figure to assure a fit. To test the sleeve, pin the pattern together, and gently fit to the arm.

Method.—(1) Place pattern to figure. (2) Press out crease in material and paper pattern. (3) Lay pattern as shown in diagram, folding material, selvedge to selvedge where directed, reading instructions on pattern and carefully noting "place to cross of material." (4) Mark all notches and guides to pleats, facings, and folds, and mark centre-backs and centre-fronts with coloured thread. Cut out and tack carefully.

When the garment is ready for sewing prepare the machine for use. Clean and oil first and, placing a piece of cloth between the presser foot and teeth, work the machine for a few seconds to let the oil get well into the bearings. Wipe off any oil with a cloth. A needle with a blunt point can be sharpened on an emery kept for the purpose.

Commence by stitching along the shoulders, then the side seams and the sleeves. Cut away any untidy edges of the seams, and make them neat by overcasting or turning under the edge once as a fold and stitching. Press these seams before doing anything further. To get the best results seams should be pressed before and after making neat. Press on the wrong side. Open out the seam, and place a damp cloth over it and press from the top downwards.

Making the Collar.—Place the two right sides together, tack, and stitch around the edge. Cut off corners of any points diagonally so that it will not be thick when turned out. Turn collar, keeping seam exactly along edge of fold, and press. Do not attempt to press without having first tacked around. A little extra trouble in the first stages will give better results, and may save a lot of worry later on. Mark position on neck of frock where the opening of collar is to be, whether in centre-front or at the side. Then mark centre-back of collar and centre-back of neck on frock. Pin collar to frock with these points meeting. Cut a strip of lining on cross about ¾in. wide, and tack around the right side of lining facing right side of frock, tacking through all thicknesses. Machine these together ¼in. from edge, cut away the edge, and turn facing over so that not any will be seen from right side and, turning in the raw edge, hem around to frock invisibly.

Putting in Sleeves.—Pin sleeve seam in position; turn garment to wrong side, leaving sleeve inside, and hold towards you with edge of sleeve even with edge of armhole. The sleeve which is the fuller is held on the top over the hand, and eased into size of armhole. Tack together before machining. Sleeve seams can be bound with a strip of thin material cut on the cross to make the edges neat. The cuff end can be finished off before the sleeve is put in if desired. Sleeve and collar may be left tacked until after the second fitting. Now place frock on for fitting, pull into place, and pin belt in position. Look over it very carefully, and note if any correction is necessary.

Measuring the Length.—Take up the length by marking an even distance from the floor. Use a yard stick and chalk, mark the length you want from the floor on the ruler. Move this around, and place a pin at intervals all the way around the skirt. If it is necessary to take your own length use the yard stick, and standing still and erect move the ruler around, putting a chalk mark on skirt at the height. This should be done in front of a mirror. Remove frock from figure, and cut away an even width from the row of pins. Turn up at the length marked, and tack along the fold at bottom. Turn in a fold at edge of hem, tack and slip-stitch by hand, and press. In thick material it is best not to turn in the edge, but stitch a piece of bias binding along. This can then be tacked flat and stitched. Ease any fulness that is likely to occur rather than put in small pleats, and do not machine the hem if the frock is to have a well-made appearance.

THE ART OF DRESS.

Under this title the following paper was read by Miss K. M. Hutchesson, of the Millicent Branch:—Clothes, it is said, make the man, but equally they can, and often do, mar the woman—a fact that too many women sometimes fail to realise. Dress is one of the most important aids to beauty. The woman who studies her type and modifies fashions to suit it is the woman who always looks well dressed. First think of a good foundation garment, and when this has been achieved the next problem is choosing of styles that are most becoming to a particular type of figure such as:—

Wide Shoulders.—For this never have wide reveres on dress or coat or any other form of width-giving trimming.

Narrow Shoulders.—Concentrate on widening the shoulders as much as possible, such as wide circular collars that come well over tops of arms. Swagger coats with wide raglan sleeves or three-quarter width wide reveres.

Broad Hips.—Women whose hips are broad should have skirts cut on the cross with insets placed flatly down centre-back and centre-front of skirt. Never have a sash end tie so that it falls on hips. If the hips are broad never let the skirt be brighter in colour than the top of frock. Tailored dresses should be chosen instead of blouses and skirts.

Arms.—If your arms are large never wear a sleeveless frock, but have your trimming below the elbow so as to make the top of arm look slender.

The Bust.—A cross-over line to the bodice gives a slender look to the too-full figure. A frilled jabot, pleated insets in the bodice, or a long cowl front are a few suggestions to the too-slender figure. Figured materials can be worn to an advantage, and square and round neck openings should be chosen instead of V-shape.

Collars.—The question of collars in relation to the type of neck is well worth studying. If the neck is short do not give the dress a collar that conceals what little you do possess! Avoid frills around the neck. Choose, instead, a turn-down collar with a V-shaped opening, or, if the style of the frock makes a square or round neck essential, be sure that it is cut low so that as much length as possible is given to the neck. For a long thin neck V-shapes must be avoided. Rounded and rather high-cut neck lines are best.

Jewellery.—A necklace is a help in disguising neck length. Luckily there is no lack of variety in modern jewellery, and these can be easily found to suit your requirements.

Footwear is another important part in the art of dress. If the ankles are large do not choose a short-toed shoe, but one that has a fairly long toe and moderately high heel. High-heeled, short-fronted shoes must be left to the woman who possesses a small plump foot and slim ankles. Self-colour shoes should be worn by the woman with large feet. It is best whenever possible to wear shoes of the same colour as the dress or suit. This is not only good from a fashion point of view, but is becoming to both large and small feet. In the case of the former matching shoes will make the feet less noticeable, and will make small feet appear still more dainty.

Hosiery is another fashion point that needs to be considered. Very bright flesh shades should be avoided by the woman with fat legs—a deeper shade is better. Always take the trouble to see if the back seam is straight, or a clumsy ungroomed appearance will result. Few women realise that a well-fitting stocking is as important as a well-fitting shoe.

Lingerie.—Well-fitting lingerie is an important asset to a neat figure. It is better to chose garments that have lace motifs inset rather than those trimmed with lace frills or frills of materials which might give a bulky effect when worn under close-fitting clothes.

Initials in metal are also one of fashion's favourites for ornaments, but these should be used with discretion. No one type of ornament should be over done.

Colour plays an important part in women's dress. The choice of the right shade to suit the complexion, the selection of good combinations of colour, and the achievement of the right colour to suit her surroundings are all points the artistic woman has to consider to secure beauty in dress. It is surprising how many women quite happily wear a green hat with a brown coat, a blue scarf with a dress beneath probably of a different shade from any of these. This unhappy collision of colours is due to the fact that the woman buys her clothes thoughtlessly. If the dress allowance is limited do not buy a thing because you fancy it, but consider in the first place whether you have any garment with which it can be worn. The danger of colour clashing lies not so much in the alliance of two contrasting shades as in two shades of the one colour or one to which it is closely related.

In dealing with colour in fashions one must consider design in dress materials. Careful choice is needed in selecting the design. The short, plump woman, for instance, should not wear a fabric that has a dark background with large bright floral design. A large woman can wear a big design as long as it is not too closely printed. The thin woman should choose a check, scroll, or a floral design. The small woman should choose a design that is closely printed. She can wear a spot design and dainty floral patterns.

Gloves are another fashion detail that must not be overlooked in achieving a well-groomed appearance. Choosing clothes or trimmings in the right light is an important factor in successful shopping. The woman who always looks well dressed is the one who chooses the right clothes for every occasion.

The shop worker often has her problem solved for her as she usually has to conform to regulation style. The office worker should avoid any kind of trimmings that may catch in office furniture, or sleeves so wide that they will become entangled in her typewriter or sweep her employer's papers off his desk when he is dictating letters. It is never necessary to look dowdy. The business girl can be as smart as her sister who does not work for her living. When a girl is facing an interview with a prospective employer she must take special care to wear the right clothes. She should dress quietly, and aim to look smart and businesslike. No dress is too elaborate for fashionable race meetings and garden parties, but care must be taken that it is not too elaborate for the wearer.

There are some lucky women who appear to have the gift of eternal youth. When they are in their late thirties they still look 25. Such women need have no compunction in dressing youthfully. Another type to be considered is the elderly woman—say, in her fifties and early sixties. Elegance must be the aim of the elderly woman; she must never make herself conspicuous by wearing bright colours or by adopting extremes of fashion. There is no need for her to be dowdy. She needs well-cut clothes that are dignified, and must not try to disguise her age.

The woman who may be described as a "busy housewife" is in a different category from those already dealt with. Possibly she lives in the country, and has very little domestic help, and can only pay occasional visits to town to buy new clothes. In other circumstances she might live up to her type, be it exotic, fragile, or artistic, and dress accordingly. When, however, she has a hungry man to cook for, maybe several children at her heels, and possibly work to do in the garden or the various details in connection with a farm house to attend to, this is not possible. She cannot wear clothes chosen by her town-dwelling sister, but she can take an interest in her appearance all the same. A woman that knows that she has made herself look as nice as circumstances permit feels a satisfaction that is definitely helpful.

It is a fatal mistake to lose interest in dress. There are women who will not trouble about their appearance because they do not enter into any great social activity. This is a selfish outlook. They should at least try to be pleasing to the eye for the sake of the people they live with, whether these be husband and children, parents, or brothers and sisters. For all occasions dress must be worn with order and dignity carefully kept and carefully put on.

COMPETITION AT GLADSTONE.

The Annual Competitive Exhibition of Women's Handicrafts was held on 19th May, there being an attendance of 33 members and 30 visitors. Mesdames Lyons, Smallacombe, Nancarrow, and McDonald, of the Georgetown Branch acted as judges, and made the following awards:—Knitted garment—1st, Miss J. Ballantyne; 2nd, Mrs. R. Lines. Babies' outfit, three-piece—1st, Miss Hewett; 2nd, Mrs. W. Ballantyne. Knitted sock—1st, Mrs. Appleton; 2nd, Mrs. G. Smallacombe. Crotchet d'oyley—Miss Jean Ballantyne, 1st and 2nd. Most useful article, value 1s., 1st, Mrs. M. Read; 2nd, Mrs. E. Pearce. Fancy work—1st, Mrs. R. Lines; 2nd, Miss Milligan. Plain sewing (apron), 1st, Mrs. H. Bennett; 2nd, Mrs. R. Lines. Scones—1st, Mrs. W. Ballantyne; 2nd, Mrs. M. Read. Butter sponge—1st and 2nd, Mrs. Barrett. Tarts—1st, Mrs. F. Weinert, 2nd, Mrs. R. Lines. Biscuits, 6 kinds—1st, Mrs. G. Smallacombe; 2nd, Mrs. Ballantyne. Sausage rolls—1st, Mrs. Weinert; 2nd, Mrs. G. Smallacombe. Polished shoe—1st, Mrs. Sambell; 2nd, Mrs. Prior. Prizes were presented by Mrs. Lyons. Mrs. Spotswood proposed a vote of thanks to the judges, and her remarks were indorsed by Mrs. R. Lines.

HOUSEHOLD HINTS FROM MONARTO SOUTH.

Mrs. H. B. White presided over an attendance of 12 members and 4 visitors at the meeting held on 16th May. The following useful Household Hints were given:—(*Miss E. Hein*) When making fruit salad, soak the oranges first in boiling water, letting stand for 5 minutes. The white, pithy part will come off quite easily with the skin and the orange is left clean for slicing. Milk can be kept fresh in a bottle of red glass. Pure, sweet milk in a plain glass bottle is utterly spoiled if left one day in sunlight, but unsterilised milk in a red bottle, or even a bottle wrapped in red paper, keeps good in the sun. (*Miss O. Baum*) When washing crepe-de-chene garments, always add a little methylated spirits to the rinsing water (1 tablespoonful to a gallon of water), wring and roll in a towel and leave at least 4 hours before ironing. This method keeps them like new until they are worn out. Cucumbers that are soft and limp need not be thrown away; simply roll them in wet tissue paper, this will make the limpest cucumber hard and keep it so for days. (*Mrs. Dohnt*) In hot weather it is a good plan to rub over a joint of meat with vinegar as soon as it is received. This will keep it fresh. Mixed with tea leaves, vinegar shaken in glass bottles keeps them clean. One part of vinegar and two parts of linseed oil is an excellent preparation for cleaning leather articles and furniture. Soak gas mantles in vinegar, and then dry them before burning off and they will last much longer. Add a teaspoonful of vinegar to the water when poaching eggs; the white will not spread. (*Mrs. G. Strauss*) On a damp washing day, add a good handful of starch to the blue water; it helps the large articles to dry quicker. To cool an oven, place in it a basin of cold water; this will quickly reduce the temperature. To remove tea or coffee stains—immediately after the linen has been stained hold it over a basin and pour boiling water through it. The stains will at once disappear. (*Miss S. Schenscher*) When making a cake with dripping add the juice of a lemon to each pound of dripping; this will be equal to butter. The best way to clean a white enamel bath is to put a little turpentine in a saucer, get a small piece of rag and well rub the bath all over with the turps, then scrub the bath with soap and warm water. (*Mrs. C. F. Altmann*) Before pressing a coat collar or reveres on a home-made coat, soap the two pieces of material on the wrong side and the heat of the iron will make them stick together without wrinkling. To prevent milk from burning—before putting milk in the saucepan, boil rapidly a few tablespoonsful of water, just enough to cover the bottom of saucepan, and it will never burn however fierce the fire. (*Miss F. Aesche*) After pig runners are washed in several waters, soak them in clean water in which a little alum has been dissolved, it will take off all the slime.

LUNCHES.

Paper read by Mrs. E. Doig at a recent meeting of the Devlin's Pound Branch:—In cutting sandwiches, put green leaves around them, and then the cloth helps to keep them fresh. Never put meat in between bread and butter; cut slices of meat, and wrap in grease-proof paper. In sending lunches out, always keep a small jar of pickles to add to the sandwiches. Tomatoes, onions, and eggs: Do not cut any of these up and add to the sandwiches, as the bread and butter gets very unpalatable. Brown bread is best; it keeps fresh longer. Small cakes are preferable. The main thing is to change the lunches as much as possible. A little fruit salad can be put in a small glass jar, or a small fruit pie. If tea is sent out to the paddock "dry tea" is best. Tea that stands in a tin develops a very nasty taste; if made fresh, it is much nicer. Use lemon in place of sugar. To keep lunches nice and cool, put all in a box, wring a bag in salt and water to which a little blue has been added, wring fairly dry, place the box inside, then take a dry one and wrap around it, and, if kept in the shade, the food will keep cool and fresh.

Fillings for Sandwiches:—Mince cold roast beef, with a little fruit chutney; use white or brown bread; shredded lettuce may be added. Corned beef and sweet pickle, with brown bread. Hard boiled eggs and shrimp paste; add lemon juice; cayenne pepper to flavour. Tomato and mint.—Slices of ripe tomato, finely chopped fresh mint, pepper and salt, a few drops of vinegar.

Pie for Lunches:—1 breakfast cup of mixed meat, I dessertspoon of finely chopped onion, 1 teacup of creamed potato, seasoning, a little milk, short crust pastry. Cut the pastry into rounds about ⅛in. thick; choose fairly large patty tins, and grease them well. Mix meat, onion and seasoning together, and put into each pie a good dessertspoon of the mixture; then cover with mashed potato, brush over with milk, then bake in a fairly hot oven until crisp and brown.

Raisin Shorts.—8ozs. plain flour, 1 level teaspoon baking powder, 2ozs. sugar, 4ozs. butter, 1 egg, and 2 tablespoons cold water. Rub butter into flour and sugar, mix to a nice dough with beaten egg and water, adding a little more water if too stiff. Knead a little, then roll as near square as possible, spread one half with raisin mixture, and fold the other on top. Roll again a little, then place on cold greased tray; cut into fingers with a sharp knife; brush over with milk, and sprinkle with sugar. Prick all over with a fork; bake from 10 to 15 minutes. Nuts can be added to the mixture if liked.

INFANT WELFARE.

The following paper was read by Nurse A. Limbert at a recent meeting of the Coonalpyn Branch:—Australia is in great need of all the infant life possible, and it is our duty to see that the babies in our care are given the very best chance of health.

A very great deal can be done by the mother-to-be by taking more care of her own health: it is not a time to lead a lazy or invalid life, as motherhood is a natural state, but she should not get over tired—a short rest after the mid-day meal, lying down with the feet up on a level with the body, and at least 8 hours' sleep at night is ideal.

The hours before midnight are more valuable for sleep than those after midnight; if she goes to evening entertainments let it be once a fortnight at most. Over eating is a mistake, it overtaxes the digestive system and causes distress. A well-balanced diet should be taken which includes:—For breakfast—Some cereal with milk and sugar or with fruit, an egg, toast with butter, &c. Dinner—Fresly-cooked meat, vegetables, spinach, silver beet, lettuce, celery, carrots, and tomatoes are among the health-giving ones. Fresh fruit, cereals, wholemeal bread, butter, cheese, milk all contain the necessary vitamins. Plenty of water should be taken, and if constipation is present a suitable mixture is as follows:—½lb. each of figs, prunes, dates, raisins, ½oz. confection of senna, 2 tablespoons treacle. Mince all the fruit, melt the treacle with the senna, mix all together, keep in a screw-top jar. Dose, 1 to 3 teaspoons daily as required. Vegetables cooked with soda or cooked a long time or twice-cooked foods *do not supply vitamins*, which are very necessary to health. Vitamins are called "accessory food factors," and are practically of unknown constitution. Their absence causes various diseases. The doctor and dentist should be visited early. The teeth should be attended to if any decay is present and any old roots removed, as one cannot be in perfect health if the teeth are not sound. The clothes should be comfortable and hang from the shoulders—no tight waist bands or tight garters. Comfortable low-heeled shoes should be worn. Pleasant company and surroundings all help to make for a happy and contented babe. It is wiser not to take any severe form of recreation at this time such as golf or strenuous tennis. Walking in the fresh air is the very best of all exercises, but have a definite destination and objective, it makes the walk all the more enjoyable. Ordinary home duties are quite all right, but avoid heavy lifting or high reaching; when hanging clothes have the line only shoulder high. For early morning sickness a cup of tea and a little bread and butter taken before getting up will probably prevent the sickness.

The Babe.—The babe should have its own little bed always and *not sleep with its mother*. A dress basket makes a splendid crib for a young infant, and if not procurable a large clean box can be fitted with slat sides and ends by a handy person. Make the slats not more than 2in. to 2½in. apart, painted or enamelled it would be quite a nice crib for a long time, and could be fitted with legs to make it easier to manage.

The mattress could be of sun or oven dried chaff and renewed when necessary; a mackintosh with small old blanket to cover, and several flannelette sheets; a small cuddling blanket, and a large single-bed blanket. The pillow, if any, should be very flat and small and *not of feathers*. Place large blanket in crib with ends over sides, then the mattress, mackintosh, old blanket, sheets, and pillow. Put the blanket about 6in. to 9in. down from the head and over the foot of crib to allow for some to be turned over the foot, place the babe in crib after making a small hollow in mattress, cover with the cuddling blanket, and fold large blanket over—one side is enough if the weather is not too cold, but the two sides may be used according to the weather, Tuck the babe in firmly; it seems to give it a sense of security.

In winter a sleeping bag is a good thing to have, made of flannel (cream or grey), on similar lines to a nightdress, but longer and wider; fasten with large buttons on the shoulder, and turn up and button at the foot; this can be done by making it similar to a man's shirt. This will save the babe many a cold and the mother many a worry. Flannel gloves can also be made and tied at wrist with ribbon or tape, but make sure they are long enough to allow for the hand to open.

Place the crib on two chairs if no proper stand is used, and so that the light does not shine directly on to the infant's eyes, yet in an airy place. Baby can sleep out of doors very early in life. For his daytime sleep he can be put in the peram. and covered right over with a mosquito net (green is a good colour) to protect from flies, &c., and wheeled out of doors to a protected position. The net should be at least 2ft. from the baby's face. He will sleep less in the daytime as he gets older, and the afternoon is the best time for what is called "mothering" time, that is, a little extra attention and cuddling by his mother for an hour or so. A baby or young child should not be excited just before his evening meal and bedtime; quiet preparations and being quietly put in bed are great helps for a good sound sleep. Baby should be put to sleep in a room near his mother's after weaning—it helps to give a sense of independence

Feeding.—A baby's natural food is best and it is also his birthright; he should be fed regularly; 4-hourly is best for a normal babe, with no night feed after 10 p.m.—6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m. is ideal. He should get sufficient food in 20 minutes. Artificial feeding should not be necessary as often as it is, and orange juice should be given daily to an artificially-fed infant. Boiled water must be given (warm) as babies get thirsty, and milk is a food, not a thirst quencher. Get baby's "wind up" before, during, and after feeding by holding in a sitting position or over the left shoulder and rubbing its back with upward strokes. Often a babe cries after being put down to sleep when, if it is raised and the back rubbed to get rid of wind, it will soon settle down and be sound asleep in a very short time.

Do not let a babe sleep on past its feed time; it should be wakened for feeding and changing soiled naps. Naps will not be soiled if the infant is trained properly from a few weeks old. Should sore buttocks occur wash carefully with a lather of a good superfatted soap and dry well, and rub in gently a little *castor oil.* If powder is used on baby use sparingly, and make sure there is not a thick layer left in the creases and folds of skin. When puting the babe down after feeding lay it on its right side as it is less likely to vomit its feed. If it is inclined to do so, it may be gently turned over on to the left side in an hour or less and not wakened.

If an infant wakes and cries for apparently no reason, make sure there is no discomfort about its clothes—no open pin sticking into it, not too many clothes on it, or its bedclothes too heavy and hot or its feet cold, or in any way uncomfortable. There may not be enough fresh air in the room, or the babe may have wind; if so, rub its back as explained before; or it may be thirsty. If it is a bad wind pain it may be given a tiny pinch of carb. soda in a little warm boiled water, and its back rubbed upwards.

Handle an infant with confidence: do not be afraid as it will then feel more secure. If the mother is nervy the babe may be placed on a pillow on the mother's lap at feeding time.

Signs and Symptoms of Sufficient Natural Milk being obtained by Infant at Regular Intervals: A contented infant, sleeping well, possessing warm hands and feet, also a good colour and firm muscular tone; a regular gain from 6-8ozs. per week being obtained in the first 6 months of age, and 4-6ozs. per week after 6 months of age. Regular, smooth motions being passed daily.

Signs and Symptoms of Insufficient Natural Milk being obtained by Infant: An unhappy, crying or screaming, restless infant sleeping badly, or a drowsy, placid infant possessing cold hands and feet; also a pallid colour and poor muscular tone, a failure to gain the usual amount in weight per week, or even a loss in weight; constipated or small, loose motions; often vomiting due to air swallowing.

Signs and Symptoms of Excessive Natural Milk being obtained by Infant: An unhappy, restless infant often sleeping badly; flushed face sometimes covered with rash; large increase in weight often followed by stationary periods; large stools, either constipated or frequent, loose and containing curds; often vomiting or suffering from colic.

To Give Fruit or Vegetable Juices.—With all utensils scalded the juice is squeezed into a standard measuring vessel, strained and diluted with warm boiled water. Orange juice and tomato juice are the most frequently chosen juices. To begin with, half a teaspoon diluted with 1oz. of warm water is given, and the juice increased gradually according to reaction of infant until the *strained* and diluted juice of one orange or one large ripe tomato is given daily. A good time for giving this solution is at 4 p.m. It is also a useful method of persuading the infant to take an extra amount of fluid (especially of water) between meals. The mother and babe should, whenever possible, spend as much time as possible out of doors. The mother should have adequate rest from babe—2 hours at least. If comforters or pacifiers are used there should be 3 or at least 2 boiled daily, and should be attached to child to prevent swallowing. If child swallows a pin or any foreign substance *do not give castor oil.* The unbeaten white of an egg is quite safe to give in the case of a pin being swallowed—about 1 teaspoon is enough for a very young child.

Mustard Bath.—Mustard baths are given for more than one reason, but chiefly in the case of convulsions; they may be due to the onset of disease or due to teething, system being below par, constipation (particularly during teething), improper diet, overloaded stomach. Onset of convulsions: Twitching of mouth, rolling of eyes, dusky colour, cyanosis, and rigidity. Get everything ready as quickly as possible. First, if a big child, get a spoon or peg and wrap it in a bit of cloth, raise head and turn to one side, and have the spoon or peg between teeth. Send for doctor if one near. Get kettle on and saucepans of water to heat, give enema of plain warm water as soon as mouth is attended to. Use 1 tablespoon of mustard to 1gall. of water, put mustard in a bit of old linen or a handkerchief and tie it securely, put it into a little cold water to dissolve, add to bath the temperature of which should be 100° or if no thermometer is handy at the heat of a hot bath.

Have doors and windows closed if in winter, undress child near fire if possible, leave napkin on if not soiled so that it can be lifted in with child, put a napkin over child and place in bath; if cold weather put a blanket over the bath. Keep water over child, and cover head and eyes with cold, wet cloth to prevent fumes getting in eyes. Keep adding hot water to keep at right temperature. When rigidity ceases (about 10 minutes) take child out of bath and wrap in two warm towels so that skin does not touch skin, and then a light warm blanket, put to bed with two hot bottles. If first enema does not act give another.

Let child sleep; when it wakens it may need a stimulant. Doctor may order brandy —1 teaspoon in water or more according to age. Doctor may order an aperient—milk of magnesia or paraffin. No food for 12 hours, only fluid, plain boiled water. Then start with weak milk mixture, increasing gradually to normal feeding in about 3 days.

Diet: 6 to 9 months of age; artificially-fed babe:—

6 a.m.—Milk mixture, 8ozs.

10 a.m.—Crust or well-baked bread baked dry in oven. Commence oatmeal jelly in cold weather or barley jelly in hot weather. Give 2 teaspoons, increasing to 3ozs. daily; do not add sugar or milk. Give also milk mixture, 8ozs.

11 a.m.—Orange juice with boiled water.

2 p.m.—Broth; plain shank broth strained; then add vegetables to broth and strain and flavour with Marmite. Milk mixture, 8ozs.

3 p.m.—Orange juice with boiled water.

6 p.m.—Milk mixture, 8ozs. thickened with Bower's sago, 1 teaspoon, or farinaceous food, 2 teaspoons.

10 p.m.—Milk mixture, 8ozs.

A suitable milk mixture for 6 months is as follows:—Milk, 3 parts; boiled water, 2 parts, with sugar added. For example, to make 40ozs. take 24ozs. of fresh milk, 16ozs. boiled water, cane sugar 3 tablespoons and 1½teaspoons. Boil milk (just boil), add water and sugar, and put into a well-scalded jug, stir while cooling, and cool as quickly as possible, keep covered and in a cool place. A cool safe can be made from a kerosene tin:—Cut sides out leaving the four corners top and bottom, cover with towelling, place bowl of water on top from which have 4 strips of flannel hanging down, put jug of milk inside on a brick, and stand the whole thing in a draught. A tray may be placed underneath to catch any water that drips down. A reliable measuring spoon can be obtained from your chemist; it is a combined tablespoon and teaspoon measure, and to measure sugar fill the spoon and level off with a knife.

Diet: 9-12 months:—

6 a.m.—Milk mixture, 8ozs.

10 a.m.—Well-cooked toast with butter, Marmite, or honey. Oatmeal jelly, 3ozs. Add milk mixture, 1oz., and sugar, ½ teaspoon.

2 p.m.—Shank broth or vegetable broth strained and flavoured with Marmite, or Marmite broth. Baked apple, rhubarb, or prune pulp. Commence with 2 teaspoons with steamed cereal cream or custard or steamed cornflour and milk. Jelly or junket; commence with 2 teaspoons. Milk mixture, 8ozs.

6 p.m.—Brown bread and butter with Marmite or plain jam and honey. Groats or Weeties, Granose, Maizena, bread and milk; add 2ozs. milk mixture. Give also milk mixture, 8ozs. Orange juice 11 a.m. and 3 p.m. with boiled water.

10 p.m.—Milk mixture, 8ozs. if necessary. (When child fully on diet this feeding is unnecessary.)

Diet: 12 months to 2 years:—

6 a.m.—Discontinue milk mixture; give orange juice.

8 a.m.—Toast with butter and honey. Porridge (unstrained) with 2ozs. of milk and ½ teaspoon sugar. Milk mixture (4 milk, 1 water), 8ozs.

11 a.m.—Water, boiled.

12 mid-day.—Broth same as at 9-12 months. White meat—fish, rabbit, tripe, brains, with white sauce. Vegetables:—Commence with pure vegetables and work up to vegetables, well mashed peas, beans, spinach, brussels sprouts; pass through a sieve other vegetables; mash finely. Sweets:—Same as 9-12 months; increase quantity. After 18 months a little red meat (scraped at first, then chopped), grilled chop or steak.

6 p.m.—Same as 9-12 months; increase quantities. Milk mixture, 4 milk, 1 water.

10 p.m.—Milk mixture only if child is frail.

CONFERENCE OF UPPER NORTH BRANCHES.

Women's Branches of the Agricultural Bureau in the Upper North were well represented at the Conference held at Eurelia on 15th July. The last Bureau Conference here was seven years ago. The women delegates held their meeting at the Eurelia Hotel, and the men in the local hall. Representatives were present from Port Augusta, Peterborough, Carrieton, Wilmington, Wepowie, Morchard, and Warcowie, 60 miles distant, where, of the nine members in this farthest north of all the Branches, five came to the Conference.

In his opening address, Mr. F. Coleman, of the Advisory Board of Agriculture, said that he strongly favoured the appointment of a woman representative for Women's Branches on the Agricultural Board.

When the women adjourned to the hotel for their meeting, Mrs. E. H. Hall (President of the Eurelia Women's Branch) took the chair. Mrs. E. P. Wall was Conference Secretary.

The Morchard Branch submitted for discussion the best way to preserve eggs, whether by greasing or in liquid. Several delegates spoke in favour of a grease preservative, which eliminated any coating on the eggs and the necessity for washing them, the use of wooden boxes with ventilation holes in preference to tins for these eggs, and the superior condition of the eggs even after six months.

A number of articles from farm and fireside were arranged on the stage of the hall for non-competitive exhibition. These included preserves and fancy work (Mrs. A. Avery), hooked rugs (Mesdames L. Schultz, A. E. Crossman, and M.

Huppatz, a still life oil painting (Miss E. Huppatz), artificial shrubs (Mrs. E. Wall), woodcarving (Mrs. M. Daly, Mrs. P. Cummings, and Miss F. Brown), knitted cushion and a toy dog made from a black fur coat collar (Mrs. J. Burns), economy-enamelled cannisters (Mrs. A. Ware), baby's knitted woollen set, embroidery, and Afghan rug (Miss M. Huppatz).

Practical demonstrations were a feature of the afternoon session of the Women's Branch of the Conference, Mrs. A. G. Avery, from Warcowie, demonstrated her own inexpensive method of bottling and preserving meats and fruits and vegetables with a home-made outfit of small ordinary screw-top bottles and a kerosene tin steriliser. Mrs. A. M. Crossman, of Warcowie, also gave a practical illustration with a slightly different method.

Boughs of wistaria, stems of hollyhock, sprays of roses, and bunches of violets all made from paper were passed round among the delegates to show the result from cut and twisted petals in forming individual flowers. This demonstration was given by Mrs. E. P. Wall, who made each individual specimen as she talked.

The following papers were read:—

HINTS AND QUANTITIES FOR ENTERTAINING.

[Mrs. C. Schulz, Morchard.]

When entertaining do the catering methodically. Everyone is anxious to have enough, but it is wasteful to provide too much. Use up the things with cream in first, if it can be managed, and a fruit cake and some home-made biscuits are a good standby, as if not required, they keep well.

One 2lb. sandwich loaf will cut 36 slices, making 18 rounds of sandwiches, which will cut into 72 small ones; ½lb. butter is sufficient to spread a 2lb. loaf for sandwiches; ½lb. of meat, cut thinly, will fill a 2lb. loaf; 6 eggs, boiled not too hard, shelled, and put into a basin with salt, pepper, and a piece of butter, the size of a walnut and mashed well with a fork will make a mixture that will spread easily, and be sufficient for a 2lb. loaf. Other flavourings, such as onion or curry powder, may be added.

To make coffee for 100, allowing 1½ cups each, requires 3galls. milk and 3galls. water. Bring to boil; have ½lb. coffee and ½ teaspoon salt in a fine muslin bag—an old oatmeal bag is excellent. Put it in the milk and water just before it comes to the boil, and leave for 10 minutes. This is strong enough for average taste.

Half a pound of tea is sufficient for 100 people; 3qts. milk is the usual allowance for afternoon tea for 100 people; 1lb. loaf sugar has approximately 112 pieces, and should be ample for 100. Cut a small round from the centre of a sponge sandwich, and the remainder will cut into 12 or 13 slices, making 14 in all.

One quart pudding or jelly is sufficient for 6 people as a sweet, and may be used for 12 small servings at a party; 1qt. ice cream will suffice for 18 plates. The allowance for each person is usually 2 sandwiches, 3 pieces of cake for every 2 people, 1 serve of ice cream, fruit salad, or other sweets.

Some Suggestions for Afternoon Tea.—(1) Ham sandwiches, cut with white bread. Celery and cheese sandwiches made with brown bread. Columbia cake. Queen cakes: Make half quantity plain, and then ice half pink and half white; cook the other with some currants added. Cream puffs. (2) Brain sandwiches, made with white bread. Egg and curry, made with brown bread. Fruit cake. Ginger sponge. Butterfly cream cakes: Make Queen cake mixture without currants. When cold, cut a little piece out of the top of each cake with an old sharp teaspoon. Fill the cavity with whipped, sweetened cream. Cut the little top piece in half, and arrange in the cream to form "wings," dust with icing sugar.

A cake that pleases the children, and also saves baking if time is a consideration, is made by using the two halves of a sponge sandwich separately. Set a rather stiff jelly in the cake tin, and when cake is required spread thickly with whipped cream and turn the jelly on to it. A red and yellow or a red and green one makes the party table look very bright. If a large quantity of ham sandwiches is required order a ham bone a few days beforehand. This can generally be bought for 1s. 6d., and the meat should be cut off and run through the mincer. It will yield from 1lb. to 1½lbs., and the bone can be used for pea soup if desired.

Add raisins to an every-day pudding for the children's pleasure, and for added flavour and nutrition. Baked apples stuffed with raisins and brown sugar and served with cream are unequalled for their flavour. Equal amounts of chopped raisins and nuts moistened with orange or lemon juice make a delicious sandwich filling.

WOOL CRAFT.

[Mrs. Ware, Wepowie.]

Preparatory Details in Knitting.—First, a right choice of knitting wool is of the utmost importance for obtaining the result desired. The instructions given in most patterns recommend a definite wool and ply as best for carrying out the individual pattern. Only by using that same wool and ply and closely following the directions can the knitter rely on obtaining the desired effect in the fabric and on giving comfort and satisfaction to the wearer.

To successfully use the directions with another wool requires great care, and any difference in thickness between the one substituted and that used for the original is sure to produce a corresponding difference in size in the finished garment. The difficulty is reduced to some extent by the system of working to measure. To this end, and before commencing the actual garment, work a piece of fabric about 4in. square. Place a tape measure widthways over its centre and, without stretching the fabric in any way, count the number of stitches to the inch. If the number of stitches to the inch be greater than the standard a smaller garment will be produced by working at such a tension—if less, a larger one.

The size of needles or hook is of similar importance. A person who works very loosely should use needles one or two sizes finer than the standard, while a larger size should be used by one who works more tightly. The stitches should just grip lightly on the needles, allowing them to move easily along the latter without dragging the work. Fabric loosely worked is apt to wear badly, besides stretching in the wash. Tight fabric tends to stiffen in washing.

All patterns are manufactured by this system of determining tension. A graph is made of the pattern required, be it flowers, objects, animals, or check designs, etc., and then the number of stitches in each different colour for each row is determined, and thus the pattern is made. With a little care any person could work any especially favoured design into a garment.

Wool should never be wound into a hard ball, as this takes away its nature, making it thin and poor. Wind loosely over 3 or 4 fingers, withdrawing the latter at frequent intervals to change the position of the ball and keep it symmetrical. Wool wound in this manner will retain its soft fullness. Never attempt to shrink yarn before knitting. There is great risk of loosening the dye and taking the nature out of the yarn, while the possible advantage in the case of a good wool well manufactured is practically nil.

Making Up a Garment.—A great deal depends upon the care with which this is done, the "finishing touch" adding style to the best of work. First run in all the ends securely on the wrong side of the garment. Lay each part of the garment separately on the ironing blanket, and pin down exactly to size and shape. Then carefully press with a damp cloth and hot iron. Sew up the seams neatly with the wool, placing the two edges evenly together and sewing stitch to stitch. Press all seams when joined. If carefully done, the joining will hardly show.

Washing.—Woollen garments should never be rubbed with soap, but should be gently moved about in warm water in which sufficient Lux or good plain soap has been dissolved to form a lather (in the case of white goods, especially their first washing, it is helpful to add a little ammonia). Hot water or too much soap or any soda shrinks wool and spoils colours; it also gives white a yellow tinge. Rinse in clean warm water of the same temperature by moving the garments to and fro—not up and down. Remove in a bundle without twisting, and squeeze out water either by putting through a wringer at a very loose tension or by placing in a heap in the centre of a cloth and twisting the ends of the cloth in opposite directions. Great care should be exercised in drying. It is absolutely fatal to hang up woollen garments to dry (even with a broom handle passed through the sleeves) as the weight of the water drags the fabric, and destroys the shape of the garment. Drying on a flat surface is best, especially if the article be laid on a clean cloth and placed on a surface which permits of a free circulation of air underneath. A frame made of wire netting is ideal for this purpose. To protect the correct shape in drying, fasten the garment to the cloth according to the dimensions required. On no account should woollen garments be put to soak or allowed to lie in a damp state. This induces shrinkage, and may cause the colours to run. To avoid staining artificial silk when washing a coloured garment made of rayon and wool, give it an extra rinse in water to which a little vinegar has been added (about 1 tablespoon to the gallon). This will prevent the colour running, and if well aired in drying any odour of vinegar will be lost.

HOME NURSING.

[Mrs. T. Orrock, Wepowie.]

Sickness in the home is often the cause of a great deal of fuss and worry. Some faint, others look miserable, and others rush about and get things in a muddle. If it is a simple malady it will soon be all right; if a serious one, getting muddled will not help in any way. Do not frighten the sick one; smile, even if you do not feel so inclined. Sick people often think they are going to be a trouble and a bother, and are very quick to notice if those caring for them think so, and they will feel very uncomfortable. If looking after anyone who is ill place the patient, if possible, in a room in which the sun will shine at some time during the day. If the light is too bright for the eyes a screen may be used; some dark material may be hung over a clothes line or towel horse. Put a green shade over the eyes, or the sick one may lie with his head at the foot of the bed where he may get more air and less light. Let fresh air in as well as the sun. Hang a sheet or blanket up if afraid of a draught. Let the air pass over and under the bed.

It is a mistake to make the room dark and dreary. In certain illnesses—sore eyes and diseases of the brain—a dark room is required, but never an airless one. If the case is infectious, such as scarlet fever, diphtheria, typhoid, &c., all carpets and curtains should be removed; only articles that will wash should be used. Make the room bright with a few flowers. Place the bed in a position that will enable the sick one to see something other than the walls. Have a small table beside the bed with a fan, magazine, covered glass of water, few flowers, and a bell. It is most irritating for a patient to want something in a hurry and have no means of attracting attention, and great harm is sometimes done. Keep the room very clean and fresh; especial care should be taken with all sanitary equipment. Do not talk about the sickness before the patient or whisper about it just outside the door. Have a table outside the room to place things upon. Only give as much food as will be eaten up at once. Never leave any food in the room. Serve all food as daintily as possible.

Make the patient as happy and comfortable as circumstances will allow. Wash all over once or twice during the day, and if restless or feverish sponge hands and face frequently. Plenty of linen in the form of sheets and pillow slips are a luxury, but one can manage with a very few. Change sheets and pillow slips every day; rinse them through water and hang out in the sun and wind to dry, or just put out in sun to air. Never mind about the ironing; they will be quite fresh again. If the case is one of infection the linen must be boiled. Old table cloths make nice tray covers or soft handkerchiefs. If old linen is scarce, and sometimes it is so in many homes, make tray and table covers out of clean newspaper, also serviettes, then these can be burnt, and it saves much washing. In infectious illness they are invaluable. A paper bag and sanitary paper of the very soft variety is very useful if there is cough and cold with much expectoration; after use it can be placed in the bag, and the bags burnt frequently, so saving a quantity of washing. Large dinner plates may be used if no trays are available.

If short of pillows, turn up a chair at the head of the bed, or raise the head of the bed on blocks. If a feeder is not available use a cheap teapot. Use pretty crockery. Do not spoil the patient, but give plenty of sunshine, bright faces, and air. Plenty of water, inside and out, with sweet, clean rooms. Plain, simple food, well prepared and nicely given. No overflowing cup or glasses. Plenty of patience is needed.

THE CULTIVATION OF DAHLIAS.

[Miss E. Roocke, Wepowie.]

Every year increased interest is being shown in homstead gardening. There are many kinds of beautiful flowers—roses, sweet peas, carnations, poppies, dahlias, etc.—but growing dahlias has gradually increased until they have become the most popular. Dahlias excel most other flowers in their beautiful colourings, and the size of the bloom is much in advance of any other.

They are as easily grown as any other plants, and grow well in all parts of this State provided sufficient water can be given them during the growing period, and especially during flowering. The dahlia is a plant that needs much moisture, and unless it is kept growing the whole time buds may form but never fully develop. To obtain large flowers it is necessary to pinch the first buds. They can be planted out any time during November and December. In very hot districts later planting is preferable, as dahlias scorch easily; they should not flower until March or April.

Dahlias make large clusters of tubers every year. To secure best results these tubers should be divided and cut, with an eye left in each piece. The clusters of tubers should be started into growth before attempting to cut up, and if planted at once the growth continues, and the plant is through the ground in a few days. It is a good plan when planting the tubers to place in the soil a strong stake at the same time, because if the staking is left until the plant is several inches high there is a great danger of injuring the roots.

Large tubers are not necessary; a small one with a small eye will make as strong growth and as good a plant as the larger tubers. Shade is not necessary, the best flowers being obtained in the open in rather a sunny position. Too much shade means tall plants with few blooms and pale colours. Although the dahlia grows in almost any soil, a rather heavy, well-manured soil is best. As the heavy soil is not always available, lighter soils can be improved by the addition of clay and cow manure.

Deep trenches may be dug, placing in them good soil heavily manured. When first planted water sparingly, increasing the quantity as the shoots make growth. Water heavily when the first buds form, and feed the plants well with liquid manure.

Here are a few names:—Rose Grivell, White Duchess, Al. Roberts, Bill Cowan, Pink Daily Mail, Miss Adelaide, Radiant Morn, Early Jewel, Elite Glory, Grace Curling, Midnight, Amazon, and Mavis Jones. Those mentioned are the large varieties. The Cactus dahlias look very nice in vases, as they can be easily arranged. Here are some good varieties:—Violet, Grace Stewart, Frau Obracht, Mrs. A. R. Book, Charles Day, Iceberg, Bonnie Campbell, Alma Dudley, and many others. Charm dahlias:—Chris, Gold Rose, Glut, Marveen, Gala, and Sunshine.

There are so many different kinds of dahlias obtainable that if nice flowers are desired it is advisable to get the good kinds. They may be a few shillings dearer, but if a few are added each year to the list it will pay in the long run, and a nice collection of dahlias will be gradually built up.

SMALL ECONOMIES IN THE HOME.

[Mrs. B. S. McCallum, Morchard.]

This subject covers a wide range, and I intend giving a few instances whereby I am able to save on my housekeeping expenses.

The greatest economy of all is in paying cash for goods; another is to produce and preserve fruit, meat, and vegetables for home requirements. Having a small fruit garden and a preserving outfit, it is a great saving to bottle fruit for future use. I have been quite successful with peaches, apricots, plums, pears, quinces, rhubarb, and apples. I also tried fruit salad. I then experimented with meat—trying pork and beans, roast beef, roast pork, corned beef, fowl, chicken, and ham. This all proves a great help when a dinner has to be packed for the men at short notice and there is no cooked meat on hand.

As we rear our own pigs we also cure the ham and bacon required for home consumption. Having a grinder we make our own wheat meal and use it for porridge, brown bread, biscuits, &c. By way of a change rolled oats are added to wheat meal for porridge. We make our own self-raising flour, and all the butter required for home use. Some people send all the cream to the factory and buy the butter. This is much more expensive than churning for home use.

Pickles, jams, sauces, chutneys are all home made. Just a hint about plum jam. When making it take about ½gall., add a tin of raspberry jam, boil and bottle. This will give a nice supply of this delicious jam for very little outlay.

Scraps of fat and skimmings from soup and boiled meat are rendered down, strained, and used for cooking (if there is a shortage of lard and butter), but they are generally used for soap making.

Sugar bags can be used in various ways. A towel made from a sugar bag is very useful when the men folk are overhauling machinery. Aprons made from sugar bags are very handy for wear in the cowyard and when gardening. Bound with cretonne they look quite nice, and save quite a lot of extra washing. A bag for holding newspapers and a cushion for out of doors are easily made, and with a stencilled design or dyed a bright colour look quite attractive. Oven holders are also a good investment, and save burnt fingers when oven slides are being used.

Worn out frilled pillow cases yield a lot of bandages. Ends of sheets can be turned into window cleaners, or made into bags if any are needed and new calico is not on hand. Binder twine, when cut at the knot, can be plaited and then sewn in circular mat. Cut up it would make a good filling for a hassock or outdoor cushion.

Old clothes, when cut up fine with a chopper, make a nice filling for a mattress or bolster. Making hooked rugs is a very profitable way of using up old garments and stockings. Those who care to use carbonate of soda as a substitute for tooth paste will find it answers the same purpose and is more economical.

Carbolic soap, which can be procured at 1d. per cake, is in my estimation superior to any other for daily use; it prevents festering sores, and cleans and heals cuts, &c.

Making one's own frocks is a great economy. It would not pay a busy mother without help to attempt it, but where there are several women in a home it is profitable, and should be included in the home duties.

Giant cement is very useful for broken crockery. So often treasured articles are broken and seem of no more use. The mended article must be put aside for a few weeks to set, and will be as good as new.

HOME-MADE PRESERVING OUTFIT.

[Mrs. A. J. AVERY, Warcowie.]

How to make meals different from the usual routine of cooking is a much harder task on the farms these days. It is a great standby to have a few bottles of preserves where one lives out from the township and is dependent on the supply of fresh vegetables and fruit from the storekeeper. Many cannot afford to purchase a bottling outfit, but a very cheap one can be made at home, and serves the purpose just as well as an expensive one. I use any screw-top bottles that are available. Most houses have honey bottles. and as the lids for these can be purchased for 9d. per dozen they are not expensive. Preserving papers are bought at the local store 5doz. for 1s., but these papers must be placed inside the lids carefully, and only used *once*. The larger bottles are used for fruit and meat, the smaller ones for vegetables, and the smallest ones for carrots, parsnips, and celery. One of these each is sufficient for one saucepan of soup.

After buying the fruit from the greengrocer preserving can be done at a cost of 4d. per bottle; a tin of fruit cannot be sold for that price. All that is required to make an extremely useful preserving outfit is:—1 kerosene tin, 1s. 3d.; 1lb. paraffin wax; 1 wire cake cooler, 1s. 3d.; 1 thermometer, 7s. 6d.; if Fowler's bottles are used. Cut the side from the tin, and turn in all around. Next place the cake sieve in the bottom of the tin to form a platform on which to stand the bottles. Then get a piece of plain sheet tin or a piece of board and make a lid to fit the top of the tin. If using a thermometer make a hole in the top of the lid, and put the thermometer into the slit so that it will dangle in the water—the preserver is now complete.

Having prepared the fruit, vegetables, or meat put the bottles in the tin, but do not let them touch. Pour in cold water until it reaches three-quarters way up the bottles, and place the outfit on the fire. A different preserving temperature is required for different fruits, vegetables, and meats. Sterilise everything at the given temperature for 2¼ hours. When the bottles are cold dip them below the lids into a tin of hot paraffin wax to make sure that they are airtight; that is the main point about the preserving.

RECIPES.

Tomato Soup.—1 bottle tomatoes, ½ cup lentils or split peas, 1 onion, 6 leaves mint (if liked), ½ cup milk (more if liked), 2 dessertspoons flour. *Method*: Place onion and lentils on fire with water, salt, and pepper to cook; then rub tomatoes through a wire sieve if not skinned before bottling. Add these to the onion and lentils, then mix the flour and milk, and add this to the above. Boil all together for 5 minutes, and it is ready for use.

Vegetable Soup.—Stock, water, salt and pepper to taste, 1 onion, 1 small bottle carrots and celery, 1 potato, and a few sticks of macaroni. *Method*: Boil onion, potato, and macaroni in stock until cooked, then add bottles of vegetables; boil all together, and the soup is ready to eat.

Mince-meat Curry.—1 bottle of mince-meat, 1 onion, pepper and salt, 1 apple. *Method*: When boiling add a little curry and a small bottle of carrots, and this for the table.

Others papers including "Uses of the Lemon," Mrs. L. Pascoe (Wepowie), and "Etiquette at Sport," Mrs. H. Noske (Wepowie), were read and discussed.

SUMMARY OF OTHER REPORTS RECEIVED.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
			WOMEN'S BRANCHES.	
Karte	6/5/36	34	Combined Meeting—Discussion	Mrs. F. N. Atze
Coonawarra	27/5/36	28	Butter Competition	Miss O. A. Lear
Clare	2/5/36	16	Dried Fruit Recipes	Mrs. A. C. Pollock
Auburn	29/5/36	26	" Rug Making "—Mesdames Blatchford and Jones	Miss L. J. Dennison
Saddleworth	2/6/36	15	Discussion—Centenary Arrangements	Miss G. E. Frost
Sheoak Log	4/6/36	29	Papers by Members	Miss K. M. Koch
Hope Forest	4/6/36	10	Hints and Questions	Miss M. E. De Caux
Coonalpyn	3/6/36	17	Election of Officers. Arts and Crafts Display	Miss E. E. George
McLaren Flat	4/6/36	—	" Flowers "—Mrs. S. Elliott	Mrs. B. Powell
Parilla	27/5/36	21	Discussion	Mrs. A. W. Welden
Kybybolite	12/5/36	21	Conference Report	Mrs. W. D. Kekwick
Rendelsham	3/6/36	22	Pruning. Bring a Gift and Buy a Gift	Mrs. W. Bignell
Balumbah	2/6/36	5	" Biscuit Making "—Mrs. H. Wohling	Miss H. D. Jerico
Pinbong	29/5/36	15	" Lunches "—Miss M. E. Kammermann	Miss D. M. Scholz
Yandiah	8/5/36	12	Question Box	Miss V. Keller
Wasleys	11/6/36	58	Novelty Competition	Miss G. Harding
Belalie	9/6/36	100	Annual Exhibition	Mrs. E. L. Orchard
Echunga	5/6/36	16	" Cake Icings "—Mrs. G. Edmonds	Mrs. F. Dennis
Owen	11/6/36	19	Question Box	Miss M. Lake
O'Loughlin	10/6/36	10	" Uses of Potatoes "—Mrs. Pfeiffer	Mrs. E. E. Lutz
Pinnaroo	5/6/36	16	Discussion—Conference	Miss N. A. Mattiske
Pygery	9/6/36	—	" Tree Planting "—Miss E. Woodrup	Mrs. A. Kammermann
Wirrabara	18/6/36	27	Address—Dr. Tassie	Mrs. E. Harding
Tantanoola	3/6/36	13	" Bread Making "—Mrs. Bird	Mrs. Gus. Altschwager
Wilmington	11/6/36	30	" Breaking in a Heifer "—Mrs. Hampel	Mrs. P. Cole
Penola	3/6/36	31	Address— M. W. Aird	Mrs. F. J. Kidman
Georgetown	11/6/36	18	Address—J. B. Harris	Miss J. E. Crawford
Maltee	7/5/36	10	" Salad Dressings "—Miss R. Schwarz	Mrs. J. A. Ferguson
Warramboo	29/5/36	—	Arbor Day	Miss Eileen Steer
Warramboo	5/6/36	12	Annual Meeting	Miss Eileen Steer
Beetaloo Valley	1/6/36	6	" The Centennial Exhibition "—Mrs. J. Halse. " The Cotton Industry "—Miss I. Pearce	Mrs. E. A. Pearce
Mangalo	10/6/36	12	Social and Gift Afternoon	Mrs. F. Coles
Strathalbyn	11/6/36	29	Rose Pruning Demonstration—H. H. Orchard	Mrs. C. M. Hudd
Maltee	4/6/36	11	" Cold Meat Dishes "—Mrs. J. Bassham	Mrs. J. A. Ferguson
Boor's Plains	4/6/36	12	Biscuit Evening	Miss L. Stanway
Waroowie	16/6/36	5	" Books in the Home "—Mrs. A. F. Crossman	Mrs. A. G. Avery
Millicent	19/6/36	12	Winter Dishes	Miss K. M. Hutchesson
Coonawarra	17/6/36	33	Debate—" Making *v.* Buying our Clothes "	Miss O. A. Lear
Clare	6/6/36	38	" History of Nursing "—Mrs. J. Christison	Mrs. A. C. Pollock
Williamstown	3/6/36	3	Formal	Mrs. G. E. Cundy
Snowtown	8/6/36	100	Combined Social	Mrs. A. Hocking
Myponga	18/6/36	7	" Kitchen Gardening "	Mrs. M. Bounds
Kybybolite	2/6/36	25	" Life in Darwin and the Far East "—Mrs. H. S. Naylor	Mrs. W. D. Kekwick
Narridy	6/6/36	36	Annual Meeting	Miss B. Reynolds
Yandiah	12/6/36	12	Conference Papers	Miss V. Keller
Warramboo	25/6/36	15	Social Afternoon	Miss Eileen Steer
Monarto South	20/6/36	22	" A Trip to West Coast "—Mrs. J. Hartmann	Mrs. F. W. Liebelt

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